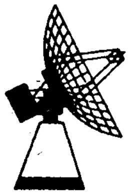
NEC Beta

MODEL PVC - 764 E

VIDEO CASSETTE RECORDER SERVICE MANUAL

SER. NO. 6014



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TECHNICAL SPECIFICATIONS OF PVC-764E

General

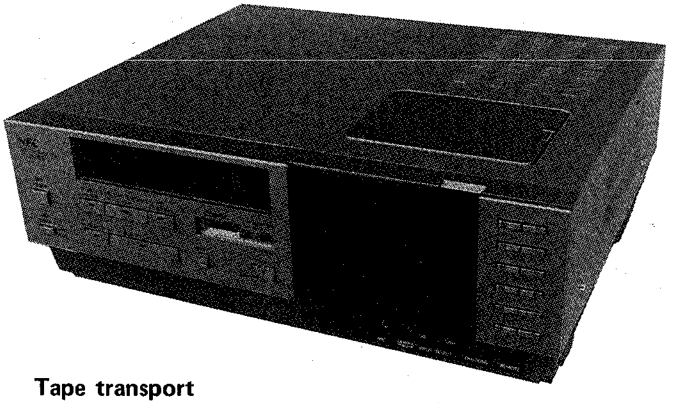
Video recording system	Rotary two-head helical scanning
Video signal	CCIR standards, PAL color
Storage temperature	-20°C to +65°C
Operating temperature	5°C to 40°C
Aerial	75-ohm, asymmetrical aerial socke
Channel coverage	VHF Western European Channels E2–12. UHF Western European Channels E21–68 (a total of up to 12 preselected channels)
RF output signal	UHF channels E30 to E39 (variable) 75 ohms, unbalanced
Power requirements	240V, 220V, 120V, 110V (selectable) 50Hz
Power consumption	32W
Dimensions	430 (W) x 350 (D) x 150 (H) mm
Weight	9.5kg (approx.)

Video

Input	VIDEO IN: BNC connector 1.0V (p-p) $^{+1.0}_{-0.5}$ V (p-p), 75 ohms unbalanced, sync negative
Output	VIDEO OUT: BNC connector 1.0V (p-p) ±0.1V (p-p), 75 ohms unbalanced, sync negative
Horizontal resolution	Color: 260 lines
Signal-to-noise ratio	Color: Better than 40 dB

Audio

Input	AUDIO IN: Phono connector 47k ohms, -10 dBs,
Output	AUDIO OUT: Phono connector Less than 10k ohms, -5 dBs (47k ohm load), unbalanced
Frequency response	50 Hz to 10kHz
Signal-to-noise ratio	Better than 40 dB
Audio distortion	Less than 4% at 400 Hz



Tape transport

Tape speed	18.73 mm/se.
Maximum recording time	2 hours 10 min (with L-500 cassette) 3 hours 15 min (with L-750 cassette)
Fast forward/rewind time	Within 4½ min (with L-500 cassette)
Timer	Only for recording Electronic digital timer AM/PM 12 hour indication

Accessories supplied

Blank video cassette tape L-250	1 piece
75-ohm coaxial cable	1 piece
Dust cover	1 piece
Channel number sheet	1 sheet

Option

Remoto Control Unit RB-74E	1 piece

Design and specifications are subject to change without notice.

SAFETY-RELATED COMPONENT WARNING !!

COMPONENTS IDENTIFIED BY SHADING AND ⚠ MARK ON THE SCHEMATIC DIAGRAMS, EXPLODED VIEWS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH NEC PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY NEC. CIRCUIT ADJUSTMENTS THAT ARE CRITICAL TO SAFE OPERATION ARE IDENTIFIED IN THIS MANUAL. FOLLOW THESE PROCEDURES WHENEVER CRITICAL COMPONENTS ARE REPLACED OR IMPROPER OPERATION IS SUSPECTED.

NEC Corporation
TOKYO, JAPAN

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SECTION 1

GENERAL

1-1-1. General Notes

- This machine is designed for operation with 240V, 220V, 120V, 110V AC power.
- This recorder is designed for operation in a horizontal position.
- Do not install the recorder in a location near heat sources, such as radiators, air ducts or in a place subject to direct sunlight, excessive dust, mechanical vibration or shock.
- Allow adequate air circulation to prevent internal heat buildup. Do not place the recorder on surfaces (rugs, blankets, etc.) or near materials (curtains, draperies) that may block the ventilation holes.
- Keep the recorder and video cassettes away from strong magnetic fields.
- After playing the tape, remove the video cassette from the compartment if the recorder is not to be used for any length of time.
- Do not transport the recorder with a video cassette in place.
- To disconnect the cords, pull it out by the plug. Never pull the cord itself.
- Generally, head cleaning by yourself is not required. Should snow or streaks appear in the playback picture after having used the recorder for an extended period of time, consult your nearest NEC dealer.
- Should any liquid or solid object fall into the cabinet, unplug the recorder and have it checked by qualified personnel before operating it any further.
- Save the original shipping carton and packing material; they will come in handy if you ever have to ship your recorder.
- For maximum protection, repack the recorder as it was originally packed at the factory.
- This machine is designed to record and playback the PAL color video signal.
- Do not place any magnetism emitting device, e.g. TV set, etc. on top of the VTR. Otherwise, noise or screen disturbance will be created, so be careful. Also, do not place any object heavier than 10 kg on the VTR.

Television programes, films, video tapes and other materials may be copyrighted. Unauthorized recording of such material may be contrary to the provisions of copyright laws.

1-1-2. Features

Motorized Automatic Front Cassette Loading
Simply insert a video cassette into the front panel slot and the PVC-764E takes over from there to complete loading process. The loading motor moves the cassette automatically and quietly so that it is properly positioned for the optimum tape/head contact.

Full Front Operation
Designwise, the PVC-764E places maximum emphasis upon operability. As well as the tape loading slot and fluorescent display, everything required for operation is conveniently located on the front panel. All the controls which are necessary when you are using the recorder itself including tape transport controls, channel select buttons and programming buttons are always visible and accessible.

Picture Search
With the picture search, you can speed through unwanted recorded material with pictures at approximately 15 times normal speed to quickly find the program you are interested in.
This picture search can also be operated in reverse mode to provide an "instant reply" of what has just be seen.

Feather Touch Logic Controls
PVC-764E gives you light-touch microprocessor controls for smooth and reliable tape transport operation.
With its full logic controls, you never have to press the stop button between operating modes.

1-week/4-program Timer for Unattended Recording
Now you can be away from home and never miss your favourite TV programs. Built-in memory circuit and precision timer synchronized with quartz oscillator frequency let you preset the VCR to record 4 programs of any channels up to 1 week in advance. And/or you can record the program which is aired at the same time every day for the full length of your cassette tape.
In case of power failure, the memory is backed up by a self-contained super capacitor for more than 1 hour.

Mode Remote Control
Sitting in your most confortable armchair, you can command 9 tape transport operations; REC, FWD, STOP, FFWD, REW, PAUSE (STILL), PICTURE SEARCH (FWD, REV) and the channel scan button (up button only) with the attached remote control unit.

Channels Preset Tuner / LED Display
Once the 12 channels have been preset, channel selection is done by simply pressing a feather touch button. And receiving channel is displayed on LED indicator.

Auto Rewind / Auto Repeat Convenience
When the tape comes to the end, it is automatically rewound to the beginning of the tape (AUTO REWIND).
And/or it is automatically started playback (AUTO REPEAT).

Pause Control / Still Playback
The pause control lets you edit out commercials or unwanted scenes during recording.
In playback mode, the tape may be momentaly stopped for a "still picture" by touching the pause button.

Record One Program while Watching Another
With its own built-in tuner, recording of one program is possible while watching another on your TV receiver.

Memory Tape Counter
When the VCR rewinds the tape with MEMORY-IN condition, it stops automatically at a point near the counter reading "9999" (one count before "0000" to avoid missing starting point).

One Touch Recording
Recording simplicity is always yours with PVC-764E. Simply load a video cassette and just push the recording button to start recording.

Recording Lap / Time Readout
You can read out the lap time of the video tape with recording mode.

1-1-3. Circuit Description

The circuity of the PVC-764 is constructed with the following main circuit boards.

Y Process
Y signal record/playback process.

Preamp & Chroma Process
Preamplifier and recording amplifier for video signal and chroma signal record/playback process.

Servo/Audio
Capsion and Drum servo circuit and Audio record/playback circuit.

Function
Function key group and Display lamp group.

Syscon
System control circuit.

Timer
Program timer circuit and TV channel select keys.

TU-VIF
U & V timer, VIF, SIF & AFT circuit.

PST
Tuner preset.

A lot of highly integrated circuits (LSI) are used in this machine. The complicated controls of the machine are alone by microcomputers used for the system control and timer sections.
The ICs used on the circuit boards are as follows.

Y PROCESS

LA7020
Recording process (AGC, Pre-emphasis and FM modulation) for Y signal.

LA7025
Playback process (FM demodulations, De-emphasis and noise canseller) for Y signal.

HD4069UB
Test signal generator.

CHROMA PROCESS

CX-136A
Color process (ACC, ACK, DET, Freq. converter)

CX-150B
PHASE detect circuit for CHROMA IDENT.

CX-832
APC & AFC circuit

CX-145
Sync seperation circuit for colour APC.

LA7019
Colour or video signal switch circuit.

M58478P
Servo reference counter.

SN74LS93
Counter

SN74LS74
Counter

SN74LS10
NAND gate.

Preamplifier

CX1S4A
RF signal playback amplifier & drop out compensation circuit.

Function

μPC393C
Operation amplifier.

LB1475
Remote control signal decoder.

Timer

μPD7507-026
Timer control circuit

μPA80C
Buffer amplifier.

Servo

μPC1504C
Drum servo circuit

μPC1505C
Capstan servo circuit

Audio

LA7040
Audio recording/playback circuit

Syscon

μPD546C-330
System control

μPD4503BC
Tri-stato buffer for key matrix circuits

VIDEO CIRCUIT

The video signal circuit consists of an Y process board and a chroma/preamplifier board. In the Y process board, a chrominance signal recording and playback circuit and a test signal generator circuit are mounted; in the chroma/preamplifier board, a chroma signal processing circuit, a color sync signal processing circuit, a pre-amplifier, a recording amplifier, and a servo reference generator circuit are mounted.

1. Recording System

The input video signal is supplied to the Y process board for use as a chrominance signal, and to the chroma/preamplifier board for use as a chroma signal.

1.1 Y Signal System

The input video signal supplied to the Y process board is fed to IC1 LA7020 via a sound trip circuit (PVC-764E is 5.5 MHz). The recording process of the chrominance signal is done by means of LA7020 is all cases. First, after level adjustment is made through AGC, the chroma signal is removed by the low-pass filter (LPF). Also, after clamping, pre-emphasis is added for frequency modulation. Not only does the pre-emphasis effects non-linear emphasis based on B format, but also causes the control of ½ fH shift to be added for reducing crosstalk between adjacent tracks. Also, white clip and black clip aremade so as to prevent over-modulation from occuring. The signal subjected to the frequency modulation will have its component in the band occupied by the chroma signal removed by the 44 fH trap and then supplied to the recording amplifier in the chroma preamplifier board.

1.2 Chroma Signal

The chroma signal component of the input video signal fed to the chroma/preamplifier board is taken out by the band-pass filter and then supplied to IC_{201} CX136A. In IC201, the chroma level is first adjusted by the ACC circuit, and a pilot burst is added to it, after which the signal is converted into a low carrier chroma signal by the frequency converter and supplied to the recording amplifier. The pilot burst is intended to be inserted in to improve the signal-to-noise ration of APC at the time of playback. The subcarrier phase locked to the burst signal component of the input video signal is added to the H SYNC section as a pilot burst.

2. Playback System

The playback signal from the video head is extremely low level. So, it is first amplified by the preamplifier. After that, this signal is separated between the chrominance signal component and the color signal component and then fed to the respective processing circuits.

2.1 Y Signal System

The output from the preamplifier of IC2 LA7025 on the Y process board is fed into the FM DEMOD circuit via the DOC circuit where it is demodulated and then passed through the de-emphasis circuit and the noise canceller circuit. As a result, a chroma signal played back by the chroma playback circuit is mixed and then output as a playback video signal. The DOC circuit causes the dropout generated on the tape to be displaced by a signal 1 fH before it for improvement of noise caused by dropout to the extent it will not be unsightly.

2.2 Chroma System

The chroma component of the output signal from the preamplifier only is taken out by the LPF, and fed to the chroma processing IC (IC_{201}) used at the time of recording, after which it is converted into a normal 4.43 MHz color signal from the low carrier color signal. The crosstalk of the signal between adjacent tracks is removed by the 2H comb filter and sent to the Y/C MIX circuit as a playback color signal.

3. Color Sync Signal System

The color sync signal system generates an idler signal for conversion into a low carrier at the time of recording and into a 4.43MHz carrier at the time of playback. At the time of recording, +44H is generated by cc (4.43MHz) locked to the burst of the input video signal, and 44H locked to H SYNC signal. Also, at the time of playback, the APC circuit is operated to generate an idler signal so that the playback pilot signal can be phase locked with the reference fsc.

AUDIO CIRCUIT

The audio circuit is mounted in the servo/audio board. This circuit consists of one integrated circuit and several transistors. Automatic gain control (AGC), recording equalization, playback equalization, and all necessary amplification are done by one IC. Transistors are used not only for oscillation of bias and erase signals, but also for recording/playback switching.

SERVO CIRCUIT

All the servo circuits are mounted in the servo/audio board. As servo circuits, the drum servo circuit, capstan servo circuit, and reel motor control circuit are provided.

1. Drum Servo Circuit

The drum is direct driven from the drum motor.

The drum servo circuit keeps motor speed at the fixed RPM by the PG signal obtained from the PG coil incorporated in the drum. This circuit makes phase comparison between the PG signal and the vertical sync signal separated from the input signal at the time of recording, and between the PG signal and the reference signal prepared by countdown from the color subcarrier at the time of playback. In so doing, the rotation phase of the drum is kept constant.

2. Capstan Servo Circuit

The capstan servo circuit is designed to: 1) to keep the tape speed at a constant speed and 2) to serve as a tracking servo at the time of playback. For capstan drive, the DC motor is used. The DC motor is subject to speed servo by FG and also to the phase servo to make phase comparison between the 25Hz prepared by countdown of the PG signal and the RF switching pulse at the time of recording, and to make phase comparison between the CTL signal played back by the tape and the RF switching pulse at the time of playback.

3. Reel Motor Control Circuit

This circuit controls the supply voltage to the reel motor for control of the tape speed at the time of cue and review. It meters the CTL signal cycle and causes the supply voltage to the reel motor to be varied for keeping the cycle nearly constant.

SYSTEM CONTROL CIRCUIT

The system control circuit consists of a SYSCON board and a function board. On the function board, the function switch and mode display LED, remote control signal decoding IC, LB1475, TU sense signal and dew sense signal amplifying IC (μPC393) are mounted, and on the SYSCON board, a microcomputer μPD546C-330 and microcomputer input data switching IC μPD4503, FWD sensing circuit, REW sensing circuit and motor drive circuit in addition, are mounted.

The μPD546C-330 sends out necessary signals to each circuit and each motor while taking the timing on reception of data from CN3 indicating the status of function switch and cassette house, data from the cam switch (CN4) indicating the status of loading ring, and data from the FWD sensor, REW sensor, and TU sensor.

TIMER CIRCUIT

The timer circuit is designed around a microcomputer μPD7507-026. It has the timer function of four programs per week.
The microcomputer has the functions of a crystal oscillator, a timer counting, program memory, and time collation. It can also be placed into the stand-by mode for time counting and memory contents holding with the detection of power failure. So, the backup of power failure for longer than one hour can be made by an external capacitor of 0.022 μF.

HIGH FREQUENCY CIRCUIT

The high frequency circuit consists of a TU-VIF board, a PST board, and an amplifier terminal strip. It has the functions of receiving a TV program and sending a VTR playback signal to the TV receiver.

1. TU-VIF Board

The TU-VIF board contains a U/V compodency tuner VIF, and SIF. It demodulates the video signal and voice signal from the TV radio wave and sends them out as recording signals.

2. PST Board

The PST board has a presetting potentiometer (band select switch mounted in), and a station selection IC μPC1363C. The μPC1363C selects the designated presetting section upon reception of CHU and CHD signals from the timer board.

3. Antenna Terminal Strip

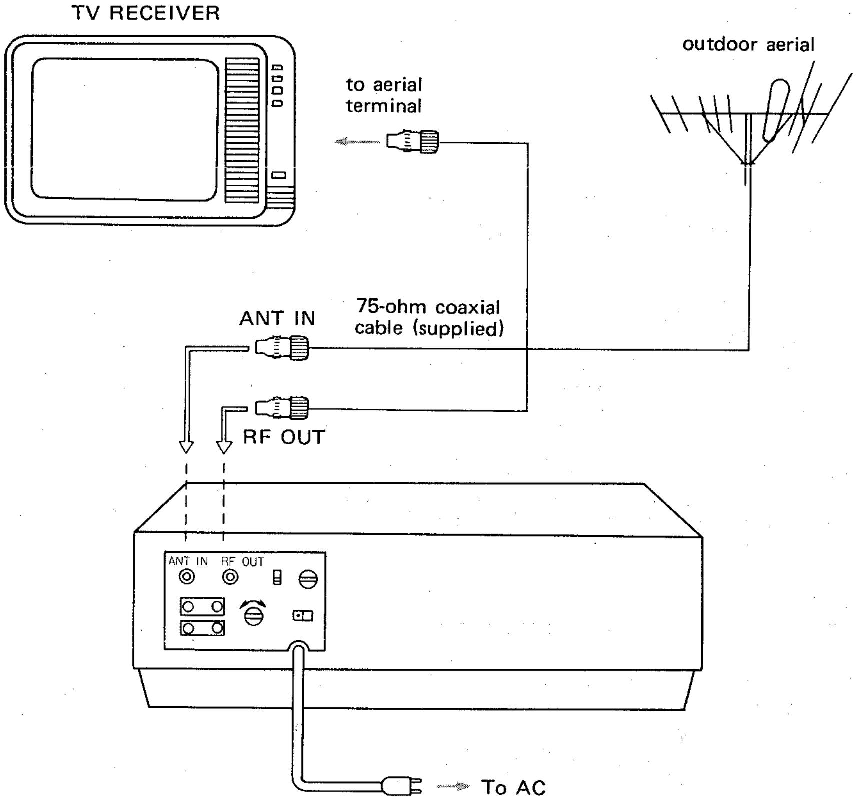
The antenna terminal strip contains a RF modulation and an antenna switch.
The antenna switch has the distribution function for distributing the received radio wave to the tuner and TV receiver inside the VTR, the burst function for equalizing the loss generated as a result of distribution, and the switching function for switching it to the TV radio wave received as a signal to be sent to the TV receiver or to a signal from the VTR. The RF modulator modulates the signal played back by the VTR to a RF signal of 30 to 39 CH UHF band so that it can be received by the TV receiver.

1-2. CONNECTION AND OPERATION

AERIAL CONNECTION

This recorder is equipped with a standard aerial connecting socket. Use a coaxial aerial connecting cable equipped with a single plug and insert the plug into the ANT. IN connector on the recorder. Make the connection between the RF OUT connector on this recorder and the aerial socket on the TV receiver with the 75-ohm coaxial cable supplied.

- Either a telecast TV signal or an output signal from the built-in RF unit is obtained from the RF OUT connector.

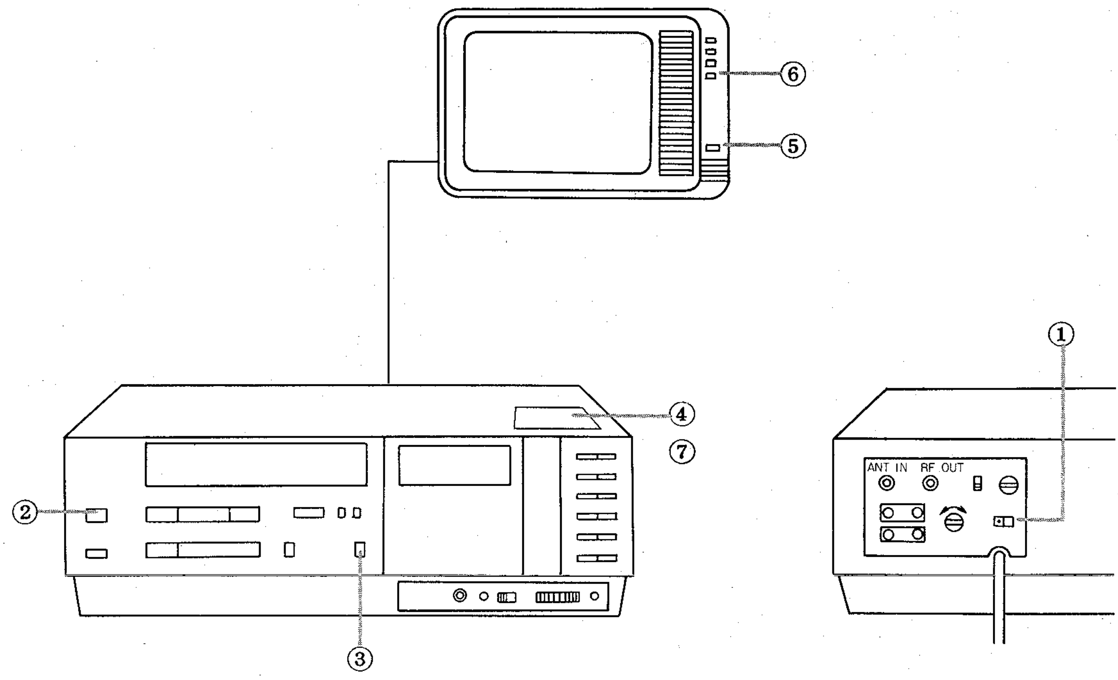


TV ADJUSTMENT AND CHANNEL PRESETTING

Once the TV receiver is adjusted for use with the recorder and channels on the recorder are preset, you can view or record a program, or do both at the same time, by pressing one of the channel select buttons on the recorder. Moreover, you can record one program selected on the recorder while viewing another program on the TV.

First adjust the TV to accept the recorder output channel from the RF unit that is contained in the compartment at the rear of the recorder. Then tune in the television channels on the recorder.

TV ADJUSTMENT



① Make the necessary connections and MAIN switch of the recorder is ON.

② Push the POWER switch to turn on the recorder.

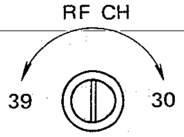
③ Push the VIDEO/TV select button so that the red VIDEO lamp will light.

④ Set the TEST SIGNAL switch in the channel preset compartment to ON.

⑤ Turn on the TV.

⑥ Adjust one of the unused program selectors of the TV to the range of the RF unit output channel – between UHF E30 and E39 – until a black and white pattern is clearly displayed on the TV screen and a high pitched tone can be clearly heard.

- If the test picture is not free of disturbance, push the VIDEO/TV button (the red lamp goes off). If there are interference signals or even a TV program on the TV screen, select an inactive channel between E30 and E39 on the TV where the picture tube shows only snow and the loudspeakers give out a steady rustling sound. Then press the VIDEO/TV button (the red lamp lights) again, and turn the screw of the RF CH selector at the rear slowly with screwdriver until the black and white pattern appears on the TV screen.



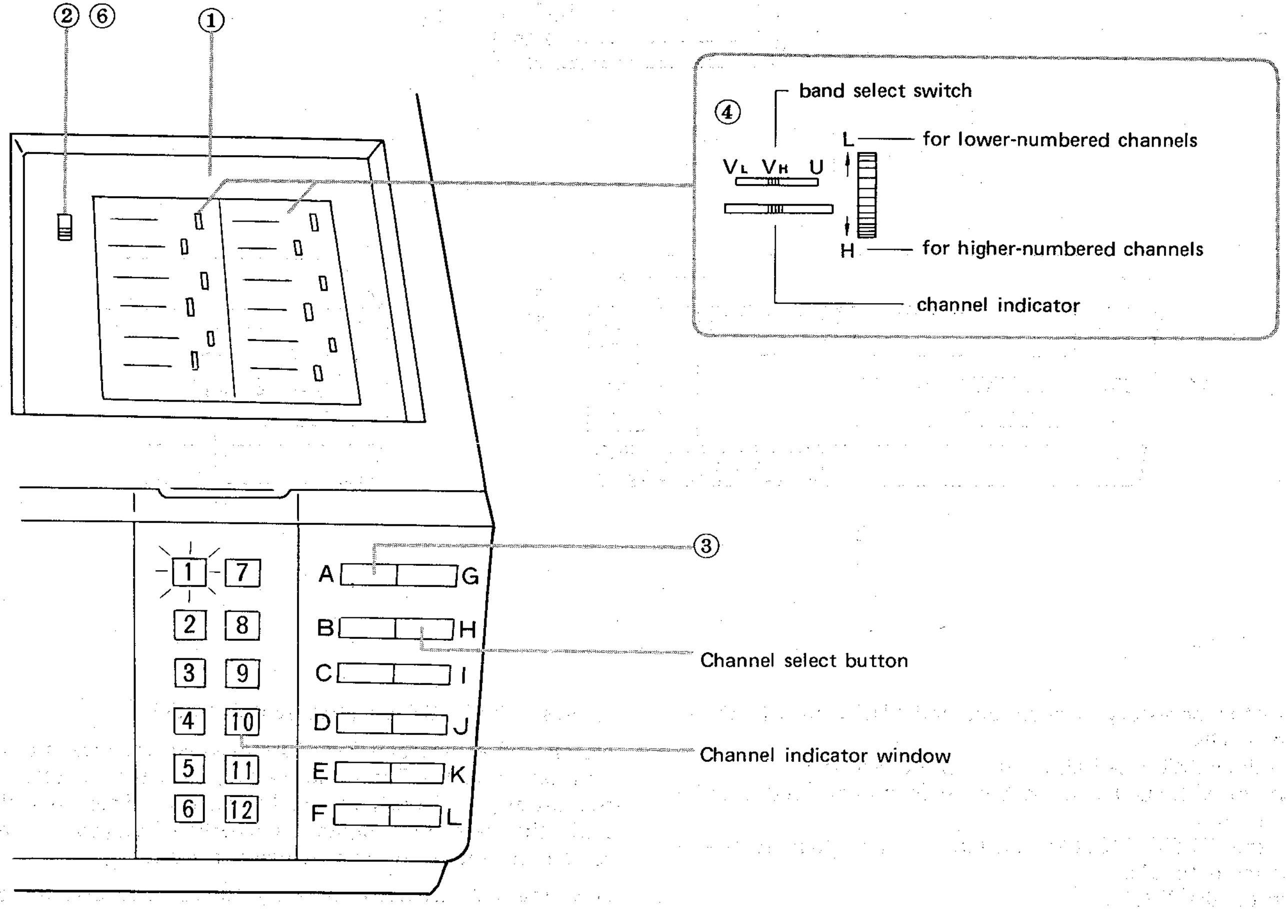
⑦ Reset the TEST SIGNAL switch to OFF.

NOTE: If a recorded Beta format video cassette is available, you can tune the TV while playing back the cassette. Insert the cassette and push the PLAY button. Then tune the TV until the cassette program is clearly displayed on the TV screen and the sound can be heard clearly.

Now the TV has been correctly tuned to receive the output signals of the RF unit.

CHANNEL PRESETTING

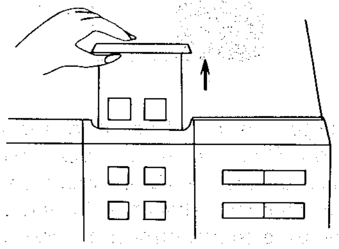
The PVC-764E has a built-in electronic tuner that is capable of receiving up to 12 television channels. Once preset, any channel may be selected by pressing the channel select button.


② ⑥
①
④
band select switch
L — for lower-numbered channels
VL VH U
H — for higher-numbered channels
channel indicator
③
1 7
2 8
3 9
4 10
5 11
6 12
A G
B H
C I
D J
E K
F L
Channel select button
Channel indicator window

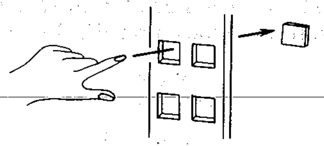
① Open the channel preset compartment.
② Set the AFT switch to OFF.
③ Push the channel select button to be preset. The associated channel indicator will light up.
④ Turn the tuning knob until the desired station is properly tuned in. The channel indicating meter provides a visual indication of the approximate location of the tuning control. When the picture appears, slowly turn the tuning knob to the right until a herringbone pattern appears in the colored part of the picture, then turn the knob back until the herringbone pattern just disappears and the picture is clear.
⑤ Repeat steps ③ and ④ for the other channels.
To identify the channels, consult a newspaper or TV program guide.
⑥ Set the AFT switch to ON when all stations have been set up as desired.

To change the number in the channel indicator window

① Pullout the channel number sheet



② Remove the number segment by pressing it out from the front.



③ Install the correct number segment.

④ Replace the sheet.

POWER SWITCH & TIMER REC SWITCH

Usually keep the MAIN switch in the ON position and turn the recorder on and off with the ON button. The MAIN switch functions as a main power on/off switch. When the switch is set to off, the power supply to all sections of the recorder, including the timer section, will be shut off and the timer memory may be erased in some cases. (See power back-up on page 21.). Press the ON button to turn on the power for routine operation. The pilot lamp will light up.

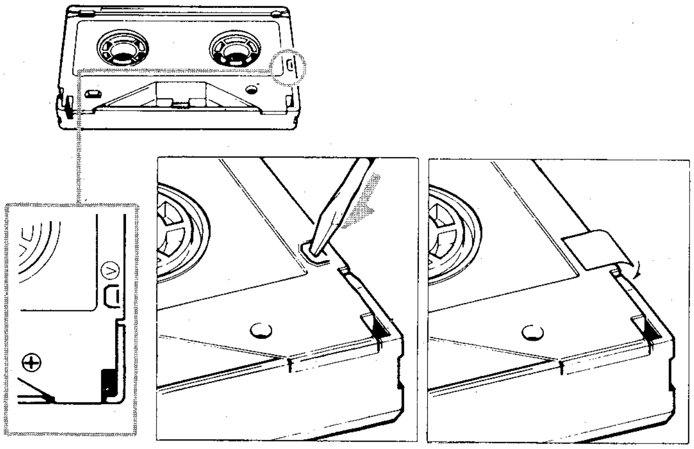
Push the TIMER REC button for timer recording. The pilot lamp will light up. Power to the recorder, except to the timer section, will shut off, preparing the recorder for timer recording.

CASSETTE LOADING / UNLOADING

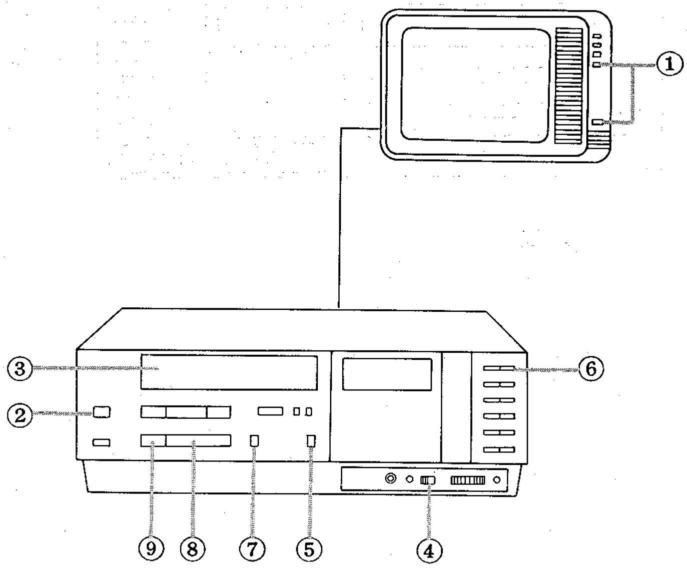
- Before loading a cassette, turn the main switch ON, insert the cassette, and lightly push it. The cassette is then automatically loaded.
- To unload the cassette, push the STOP/EJECT button. This button has both STOP and EJECT functions. When pushed while the recorder is stopped, the cassette can be removed. When the tape is moving, push this button once to stop it, then push it once again, and the cassette will be ejected.

VIDEO CASSETTE SAFETY TAB

To protect a recording from accidental erasure, break off the tab on the bottom of the video cassette using a screwdriver or similar tool. With the tab removed, the record mode does not function. If you wish to record on a cassette with the tab removed, simply cover the hole with a piece of cellophane or vinyl tape.



TV PROGRAMME RECORDING



① Turn ON the power switch of the TV set, then set receiving channel to the output channel of the VTR.

② Turn ON the MAIN switch* and POWER switch of the VTR.

③ Load a Cassette.
Before loading, carefully check that the anti-erase tab on the cassette rear surface is not broken, then insert the cassette. If the tab is broken, video recording is not possible.

④ Set the INPUT SELECT switch to TUNER.

⑤ Set the VIDEO/TV switch to VIDEO (red lamp lights up).

⑥ Choose a recording programme using the channel selector button on the VTR.

⑦ Push the RECORD button. Record lamp (red) lights up and recording starts. If the safety tab on the cassette rear is broken, the cassette is ejected at this time.

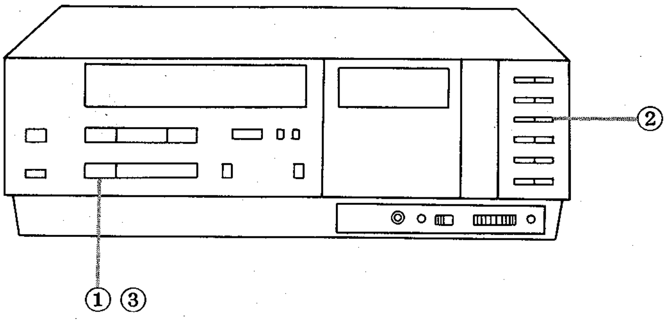
⑧ To stop recording, push the STOP button.

⑨ Pause
Use this button to leave out unnecessary portions, such as commercial advertisements.
The picture appears on the TV even during the pause mode, but it is not being recorded.

Automatic release:	To protect the tape, the pause mode is automatically released after 5 minutes, and the recorder returns to its original recording mode. Therefore to stop the recorder for long periods, use the stop button.

NOTE; * The MAIN switch is located on the rear panel.

CHANGING TV CHANNEL DURING RECORDING



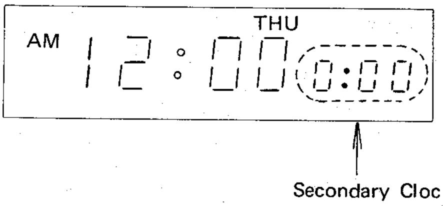
Because of a protective device, the channel will not be changed even if the channel selector button is pushed during recording. To change the channel, take the following steps:

① Push the PAUSE button to set the recorder in the pause mode.
② Switch the TV channel of the VTR.
③ Push the pause button again, recording will start.

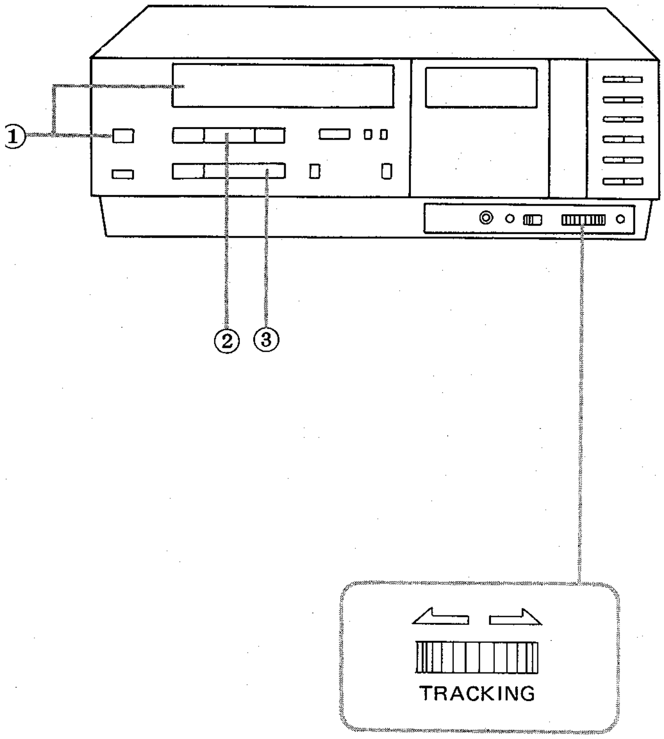
NOTE. Also in the stop mode, the channel change is possible.

Elapsed Recording Time is Displayed
At the start of recording, the secondary clock in the timer display is reset to 0:00. Thereafter, elapsed time is displayed while recording and is very convenient for monitoring the remaining tape length.
◦ In the pause mode, counting stops.

Timer Display



PLAYBACK

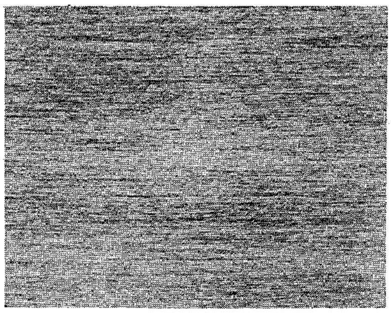


① Turn ON the POWER switch and load a cassette.
② Push the FWD button. Then, the playback picture from the video cassette appears in a moment. (VIDEO/TV switch is automatically set to VIDEO)
③ Push the STOP button to stop playback.

TRACKING ADJUSTMENT

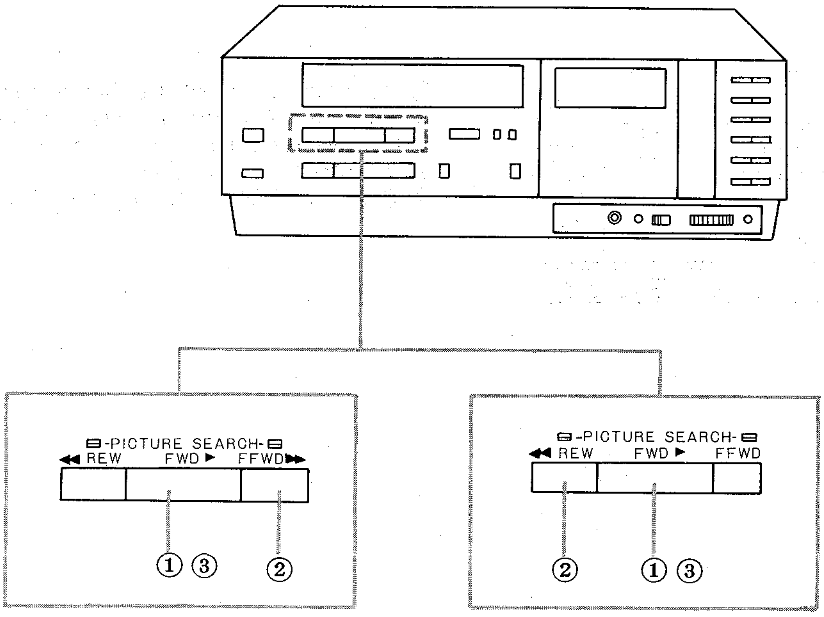
In the unlikely event that streaks or snow appears in the playback of tapes made on other recorders, turn the TRACKING control in either direction until the best picture is obtained. Allow a second or two for the new settings to take effect. When playback of this particular tape is finished, return the TRACKING control to its center detent position.

SHOULD SNOW OR STREAKS APPEAR



The appearance of snow or streaks in the playback picture may indicate the need for cleaning the video heads inside the recorder. Should the need for head cleaning be suspected, consult the dealer from whom the recorder was purchased.

PICTURE SEARCH



Forward picture search

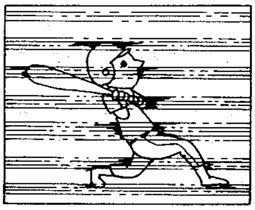
① Push the FWD button to the playback mode.
② To watch the picture at a quick speed in a forward direction during playback, push the F.FWD button.
③ To reset the playback mode, push the FWD button once again.

Forward picture search is also set by pushing the F.FWD button during reverse picture search.

Reverse picture search

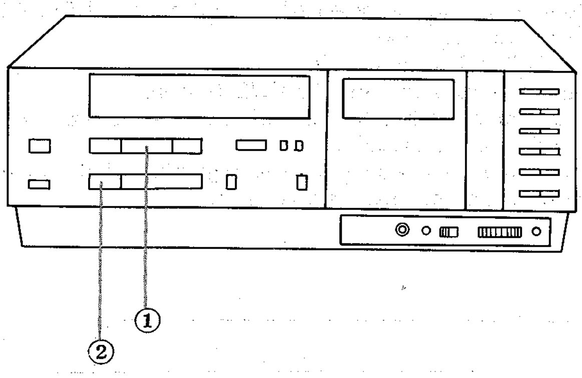
① Push the FWD button to set the playback mode.
② Push the REW button during playback, then the playback picture appears at a fast speed in the reverse direction.
③ To reset the recorder to the playback mode, push the FWD button once again.

Reverse picture search is also attained by pushing the REW button during forward picture search.



- Several streaks may sometimes appear but this is not a malfunction.
- When the picture rolls vertically, adjust the V.HOLD of TV set.
- Picture search does not work during recording.
- Sound can not be heard during picture search.

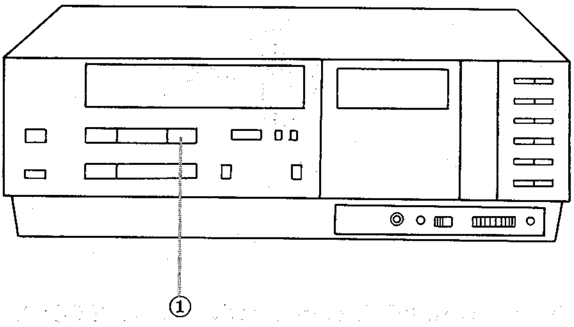
PAUSE



① Set the playback mode by pushing the FWD button.
② Push the PAUSE button, then a still image is visible. Push the PAUSE button once again, then the original playback mode is reset.

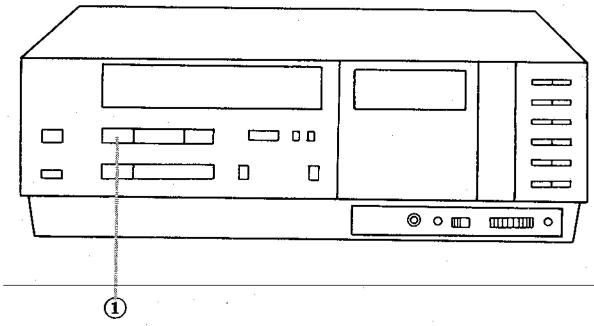
- A pause is automatically released after about 5 minutes and the recorder is reset to the original mode.

FAST FORWARD



When the F. FWD button is pushed in the stop mode, the tape is quickly advanced. When the F. FWD button is pushed during forward picture search, the tape returns to the fast forward mode.

REWIND



When the REW button is pushed in the STOP mode, the tape is rewound. When the REW button is pushed during reverse picture search, the tape returns to the rewind mode.

FULL AUTO REWIND

When the tape reaches the end, it will stop automatically and the REC, FWD, or FF lamp will go out. Then, the REW lamp will light up and the tape will automatically rewind to the beginning and stop.

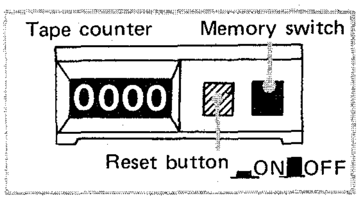
TAPE COUNTER AND MEMORY SWITCH

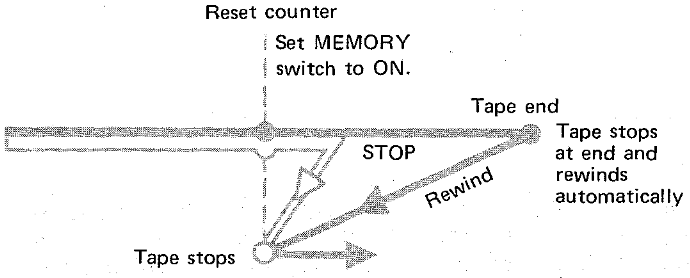
For later reference in playback, reset the Tape COUNTER to "0000" before starting a recording.
The MEMORY switch is used for precise programme relocation of a recorded tape.

① Locate any desired starting point on the tape and reset the Tape COUNTER to "0000" at this point.
② Set the MEMORY switch to ON.
③ Play or record a tape.
④ Press the STOP button.
⑤ Press the REW button.

The tape will rewind and stop automatically at a point near the tape COUNTER reading "9999" (one count before "0000" in order to avoid missing the starting point).

- To rewind the tape further than "0000", press the REW button again.


Tape counter
Memory switch
0000
Reset button
ON
OFF


Reset counter
Set MEMORY switch to ON.
Tape end
STOP
Tape stops at end and rewinds automatically
Rewind
Tape stops

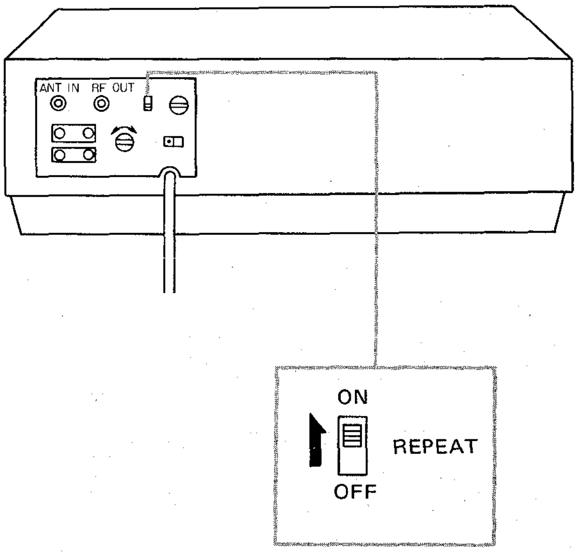
NOTE

- When this function is not required, set this switch to OFF.

AUTO REPEAT

A tape playback can be repeated by setting the REPEAT switch on the rear to (ON).

1 Set the REPEAT switch to ON.
2 Load the cassette and push the FWD button.
3 When the tape reaches the end of the tape, it stops and starts rewinding automatically.
4 When the tape is rewound to the beginning of the tape, rewinding stops and playback starts again.

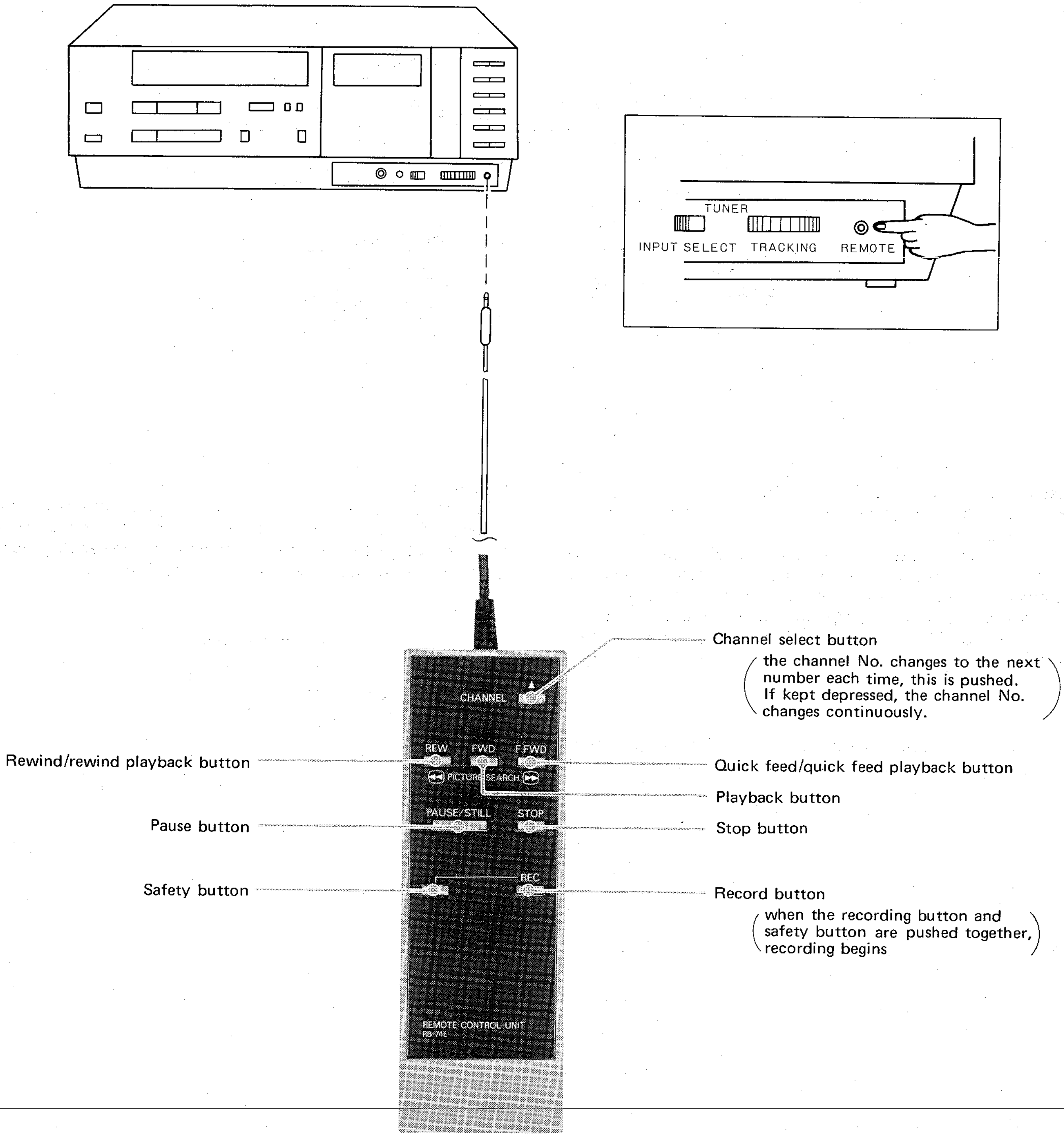

ANT IN
RF OUT
ON
REPEAT
OFF

NOTE

- When the AUTO REPEAT switch is ON, the TAPE COUNTER MEMORY switch does not work.

REMOTE CONTROL OPERATION

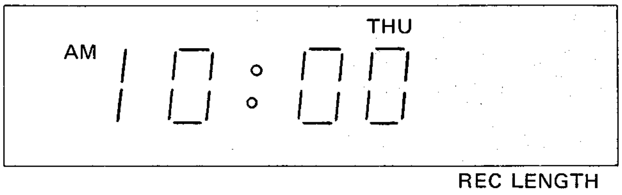
With the use of the Remote control unit (optional), you can command F.FWD, FWD, REW STOP, REC, PAUSE/STILL, PICTURE SEARCH and CHANNEL SELECT away from the recorder.
The function of the controls on the remote control unit is the same as on the VTR.

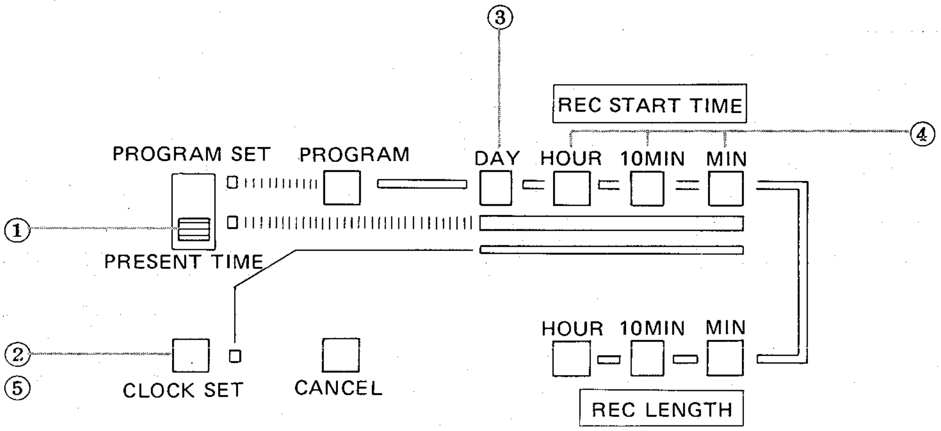

TUNER
INPUT SELECT
TRACKING
REMOTE
CHANNEL
REW
FWD
F.FWD
PICTURE SEARCH
PAUSE/STILL
STOP
REC
REMOTE CONTROL UNIT
RB-74E
Channel select button
Rewind/rewind playback button
Quick feed/quick feed playback button
Playback button
Pause button
Stop button
Safety button
Record button

Channel select button (the channel No. changes to the next number each time, this is pushed. If kept depressed, the channel No. changes continuously.)

Record button (when the recording button and safety button are pushed together, recording begins)

TIME SETTING

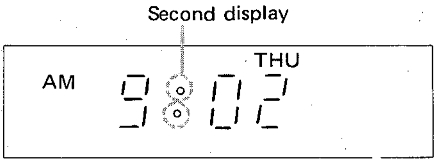

THU
AM
10:00
REC LENGTH


③
REC START TIME
④
PROGRAM SET
PROGRAM
DAY
HOUR
10MIN
MIN
①
PRESENT TIME
HOUR
10MIN
MIN
②
⑤
CLOCK SET
CANCEL
REC LENGTH

① Set the switch to PRESENT TIME.
② Push CLOCK SET and keep it on until the end of the time setting procedure.
③ Push the DAY button to set the day of today. The day indication proceeds SUN→MON→TUE→···· sequentially with each push. If kept depressed, it changes continuously.
④ Using the 3 time-setting buttons, set the present time.
⑤ When the CLOCK SET button is released, the clock starts operating.

OTE
A quartz is used in the timer. But for using it as an accurately timer, check the time at least once a month.

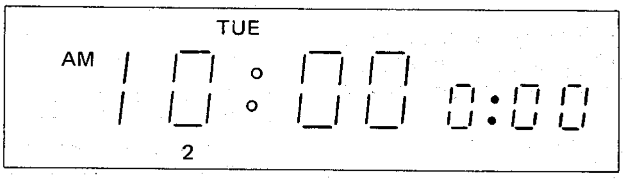
Second Display
The colon between the hour and minute numbers shows second. In the first 30 seconds of a minute, the upper dot flickers and, in the second 30 seconds, the lower dot flickers. Colon flickering takes place at 2-second intervals.

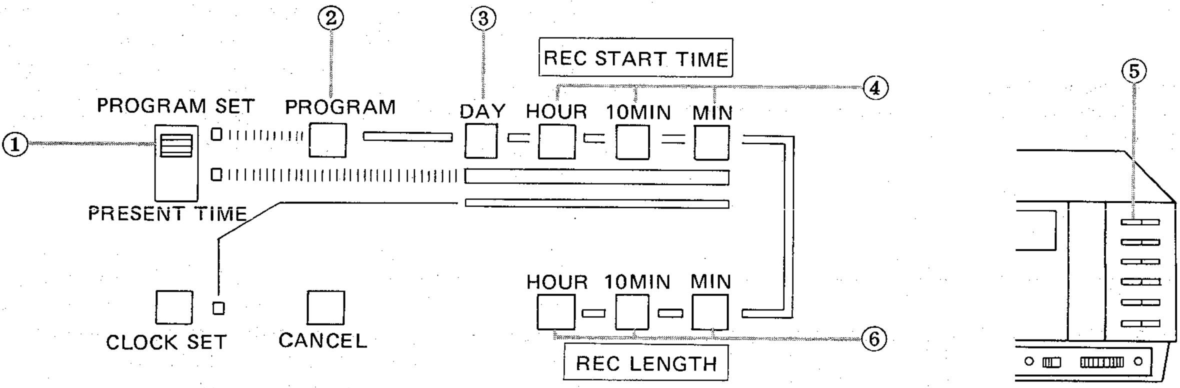

Second display
AM
9:02
THU

TIMER RECORDING (Unattended)

1. How to set the time recording

Set recording DAY, REC START TIME, REC LENGTH, and TV channel, as desired.


TUE
AM
10:00
0:00
2


②
③
REC START TIME
④
⑤
PROGRAM SET
PROGRAM
DAY
HOUR
10MIN
MIN
①
PRESENT TIME
HOUR
10MIN
MIN
CLOCK SET
CANCEL
⑥
REC LENGTH

① Set the switch to the PROGRAM SET position. The contents of the programme 1 are displayed on the panel. When no programme is reserved in program 1, the following are displayed as the initial condition.

MAIN CLOCK .... AM 12:00
SUB CLOCK 0:00
DAY .... Same day as today
TV channel .... Channel corresponding to the A button (left top)

② Set a program No. by pushing the PROGRAM button. Programme No. sequentially changes 1→2→3→4→1 .... each time the button is pushed. However, these figures are not related to the order of the recording schedule.

③ Push DAY button to set the recording date. The day sequentially changes SUN→MON→TUE →···· each time the button is pushed. By continually pushing, all days can be displayed from SUN ······ to SAT. By this way, the same programme aired at the same time everyday can be reserved.

④ Set the record starting time by pushing the④REC START TIME buttons.

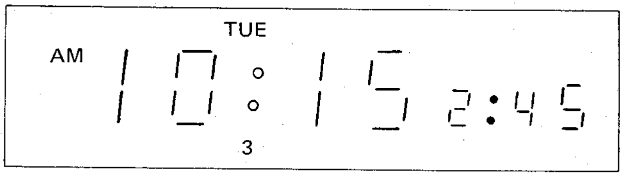
⑤ Push the button of the desired TV channel to be recorded. The channel lamp corresponding to the button flickers. When changing a channel once reserved, directly push the desired channel button to reserve it. The channel you pushed its button last will be reserved.

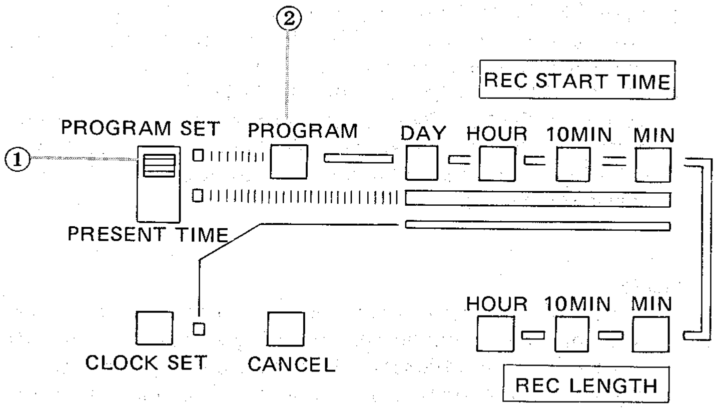
⑥ Set recording time length using the ⑥ REC LENGTH buttons. Be careful not to forget setting the REC LENGTH. If it is not set, recording will not make, so be sufficiently careful.

- One programme reservation has been completed by this way. Repeat the above procedure for reserving 3 other programmes.
- After completing all reservations, return the switch to PRESENT TIME. Present time is displayed on the display.

2. How to confirm reserved contents

(ex. confirming the contents of Program 3)


TUE
AM
10:15
2:45
3


②
REC START TIME
PROGRAM SET
PROGRAM
DAY
HOUR
10MIN
MIN
①
PRESENT TIME
HOUR
10MIN
MIN
CLOCK SET
CANCEL
REC LENGTH

① Set the switch to PROGRAM SET.
② Push the PROGRAM button to call Program 3.
③ Then, the contents reserved in Program 3 are indicated on the display.

ex. Program No. : 3
Reserved day : TUE
REC START TIME : AM 10:15
REC LENGTH : 2 hours 45 minutes
Recording TV channel : 1

3. How to change reserved contents

Call the Program No. to be changed by pushing the PROGRAM button. Then the reserved contents are displayed, so newly set the part to be changed by the same way for previous reservation

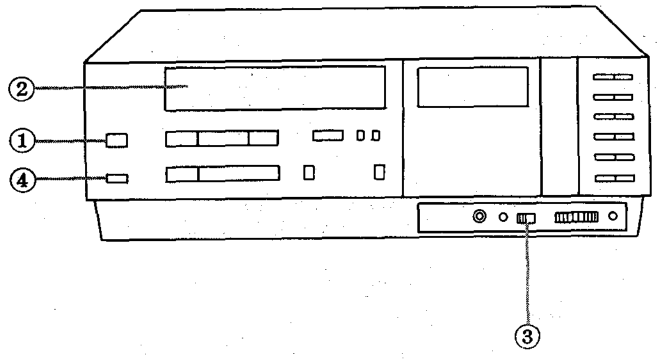
4. How to cancel reserved contents

Call the Program No. to be canceled by pushing the PROGRAM button. Then when the previously reserved contents are displayed, push CANCEL button. Thus, the reserved contents disappear and the display changes to:

Weekly day→Day indicated in present time
Record starting time→AM 12:00
Recording time length→0:00
TV channel→Channel corresponding to the A button.

5. How to record using the timer

After setting the timer reservations, prepare timer-record by the following method.



① Turn ON the VTR POWER switch.
② Load a cassette tape. Before doing this, carefully check that sufficient tape remains for timer-recording.
③ Set the INPUT SELECT switch to TUNER.
④ Turn OFF POWER switch, then turn on the timer-recording switch. Then, the timer lamp lights up. If the safety tab is broken, the timer lamp will not light up. If this happens check the cassette.

NOTE

In case of the above, if the recording time is superimposed with another programme, the Programme No. on the timer display face flickers. Then, set the programme reserve mode, call the flickering programme No. and check the contents of the reservation. This superimposition warning appears only when the mode is present time display, the timer-recording switch is ON and the timer lamp is lit. Therefore, check it every time when a reservation is completed, carefully check it.

- When, the timer-reserved time comes, timer-recording starts. Simultaneously with the start of timer-recording, the programme contents are cleared.
- The programme No. and recording order are not correlated. Out of all timer reservations, timer-recording will start in the order of the date of reservation then the time of recording start.

6. Precautions for timer use

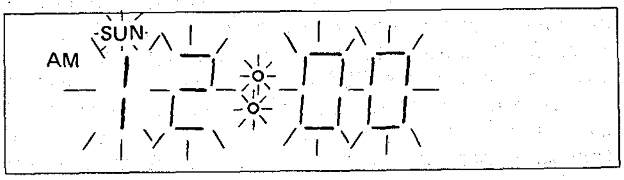
- The timer reservation can not be made when the VTR is in the recording mode. Even if the switch is set to PROGRAM SET, only the present time and the elapsed recording time are displayed.
- During timer recording, each operation (stop, pause, ...) is disabled. To operate any of these functions, push the POWER switch ON. If the POWER switch is pushed during timer recording, the microprocessor judges that timer recording has finished. Therefore, when the POWER switch is OFF once again, then the power supply is interrupted and the recorder returns to a stand-by mode for the next timer recording.

7. Memory Protection

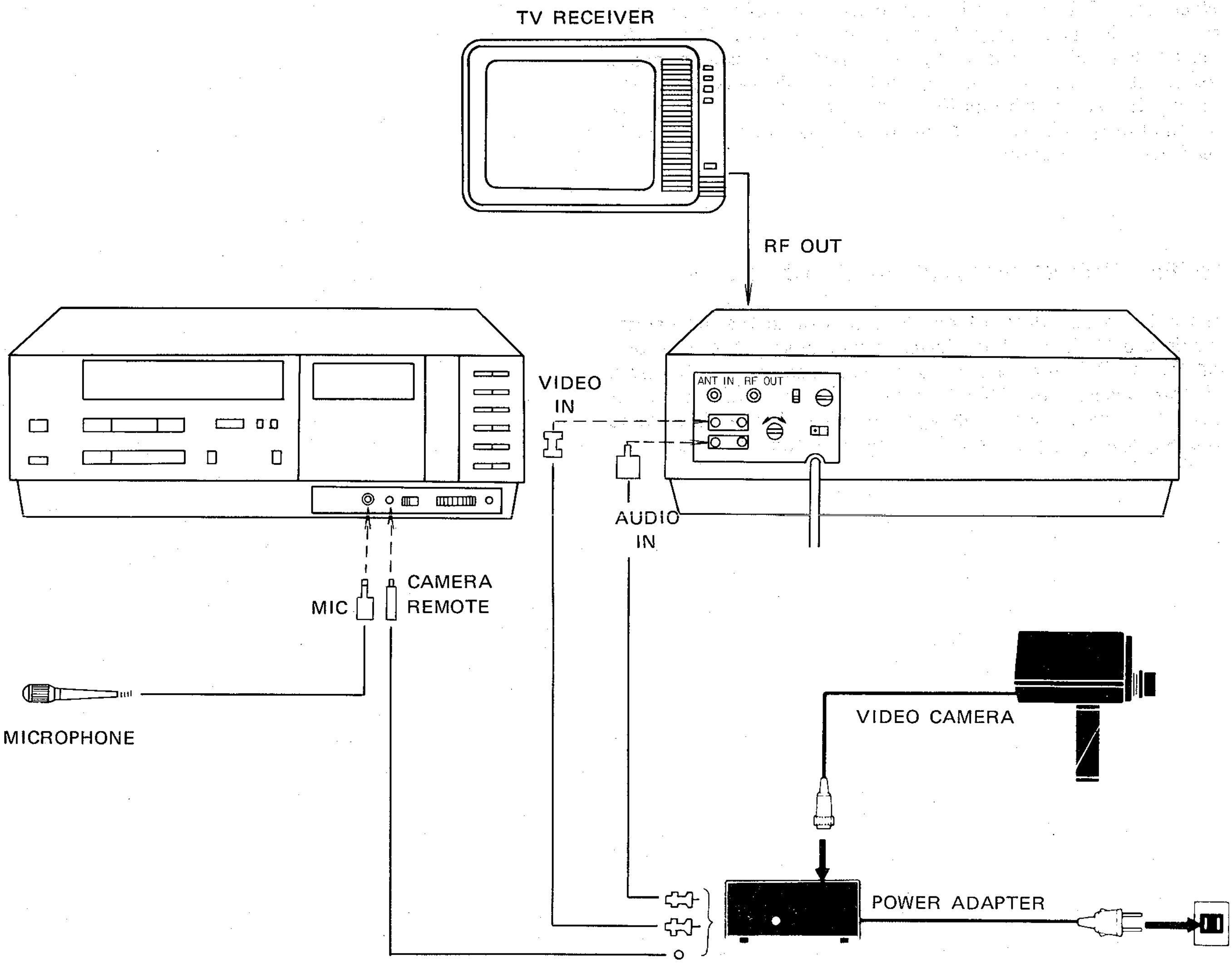
- The timer unit of this VTR contains a memory protective circuit against a power failure. If the failure is within approx. 1 hour, the timer display disappears but the clock continues operation and, when power resumes again, the correct current time will appear in the display. (The contents of timer reservation also remain.)
If the power fails during timer recording, the recording for the remaining time will continue again when the power resumes as long as the failure is within the above limit.

Power Failure Waring

If the power failure continues for longer than 1 hour, DAY and TIME flicker at about 0.5 sec. intervals. During this flickering, the contents of PRESENT TIME and PROGRAM SET are cleared, so correct them according to page 19.



CONNECTIONS FOR ADDITIONAL USES


TV RECEIVER
RF OUT
VIDEO IN
ANT IN
RF OUT
AUDIO IN
CAMERA REMOTE
MIC
MICROPHONE
VIDEO CAMERA
POWER ADAPTER

Refer to the instructions furnished with the equipment to be connected.

Notes

- Cameras must conform to CCIR TV standars.

When a camera is connected to the VIDEO IN connector using a BNC-type connector, set the INPUT SELECT switch to LINE.

- When both microphone and line audio are connected to the recorder, the microphone takes precedance over the line audio.
- In case the VIDEO CAMERA is equipped with the pause control, by connecting CAMERA PAUSE terminal, pause control is available.

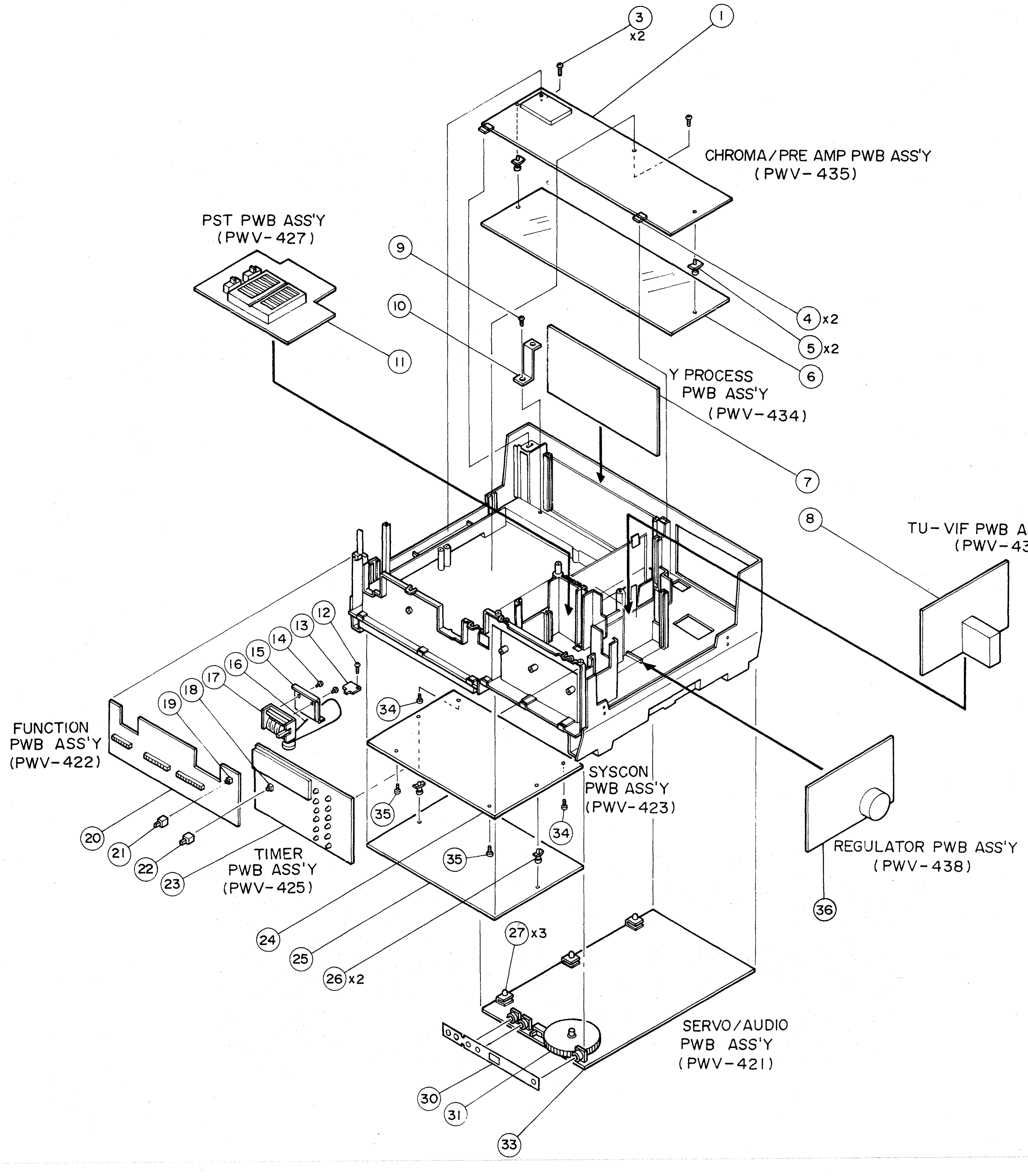
WHEN THE DEW LAMP LIGHTS UP

When the VTR is abruptly moved from a cool area to warm area, condensation may form inside the unit. When this occurs, the indicator lamp lights up and, if a cassette tape is inside, it is automatically ejected. In this case, keep the power ON, and a dehumidifier works to remove the moisture automatically. Then, the lamp will go out to indicate readiness of operation.

WHEN THE STOP LAMP IS FLICKERING

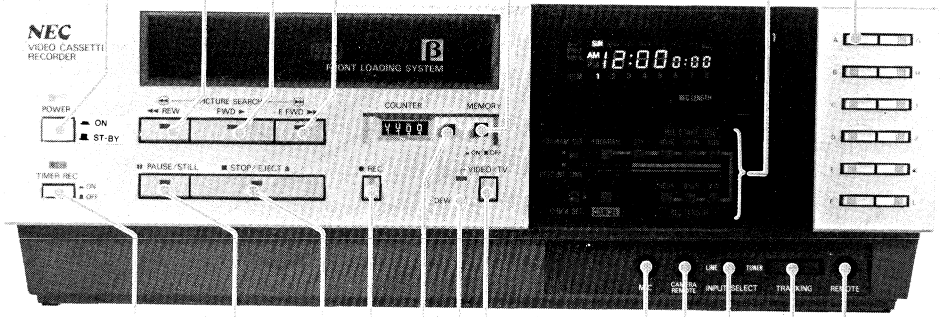
If trouble occurs during tape movement or to the mechanism inside the VTR, a safety device works to stop the operation of the VTR automatically to prevent damage to the tape. If this occurs turn OFF the main switch once and, after several seconds, turn it ON again to start. If the STOP lamp flickers again, request repair or maintenance from an NEC dealer.

1-3. LOCATION OF PARTS AND CONTROLS



③ x2
①
CHROMA/PRE AMP PWB ASS'Y
(PWV-435)
PST PWB ASS'Y
(PWV-427)
⑨
⑩
⑪
④ x2
⑤ x2
⑥
Y PROCESS
PWB ASS'Y
(PWV-434)
⑦
⑧
TU-VIF PWB ASS'Y
(PWV-436)
⑫
⑬
⑭
⑮
⑯
⑰
⑱
⑲
FUNCTION
PWB ASS'Y
(PWV-422)
⑳
㉑
㉒
㉓
TIMER
PWB ASS'Y
(PWV-425)
(34)
(35)
SYSCON
PWB ASS'Y
(PWV-423)
(34)
(35)
REGULATOR PWB ASS'Y
(PWV-438)
(36)
㉔
㉕
㉖ x2
㉗ x3
SERVO/AUDIO
PWB ASS'Y
(PWV-421)
㉚
㉛
(33)

LOCATION OF PARTS AND CONTROLS (FRONT VIEW)


NEC
VIDEO CASSETTE RECORDER
FRONT LOADING SYSTEM
POWER
ON
ST-BY
TIMER REC
ON
OFF
PICTURE SEARCH
◀◀ REW
FWD ▶
F FWD ▶▶
PAUSE/STILL
■ STOP/EJECT
COUNTER
MEMORY
● REC
VIDEO/TV
DEW
ON ■ OFF
12:00 0:00
LINE
TUNER
MIC
CAMERA REMOTE
INPUT SELECT
TRACKING
REMOTE

④ F. FWD Button (▷▷) /PICTURE SEARCH Button (▷▷)

③ FWD Button (▷)

② REW Button (◁◁) /PICTURE SEARCH Button (◁◁)

① POWER Switch

⑤ MEMORY Switch

⑥ TIMER Operating Button

⑦ Channel Button

⑧ TIMER REC Button

⑨ PAUSE/STILL Button (▯▯)

⑩ STOP Button (□)/EJECT Button (⏏)

⑪ REC Button (●)

⑫ COUNTER Reset Button

⑬ DEW (Condensation) Indicator

⑭ VIDEO/TV Button

⑲ REMOTE Connecter

⑱ TRACKING Knob

⑰ INPUT SELECT Switch

⑯ CAMERA REMOTE Terminal

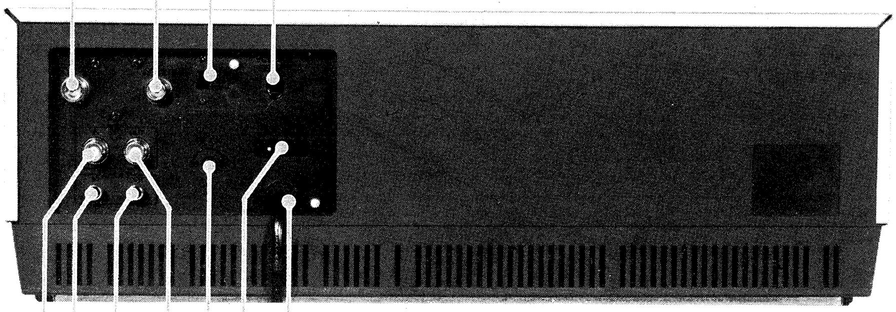
⑮ MIC Input Terminal

⑳ ANT IN Terminal

㉑ RF OUT Terminal

㉒ REPEAT Switch

㉓ Voltage Selector



㉚ Power Cord

㉙ Main Switch

㉘ RF CH Selector Knob

㉗ VIDEO OUT Terminal

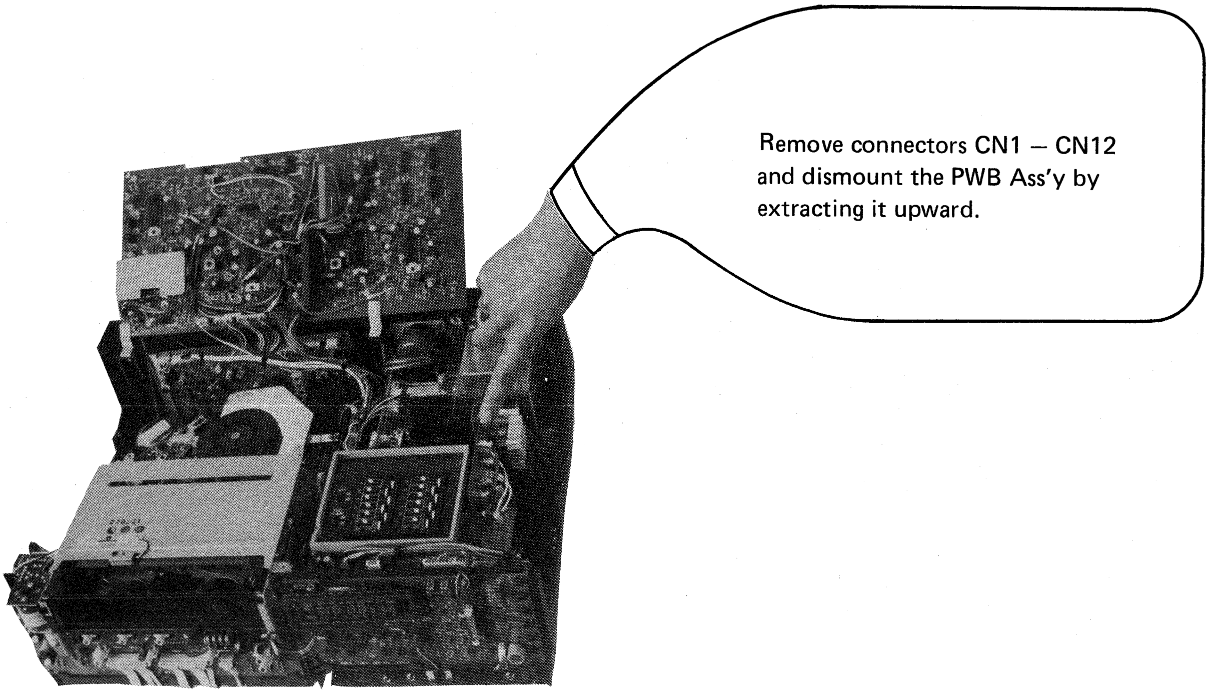
㉖ AUDIO OUT Terminal

㉕ AUDIO IN Terminal

㉔ VIDEO IN Terminal

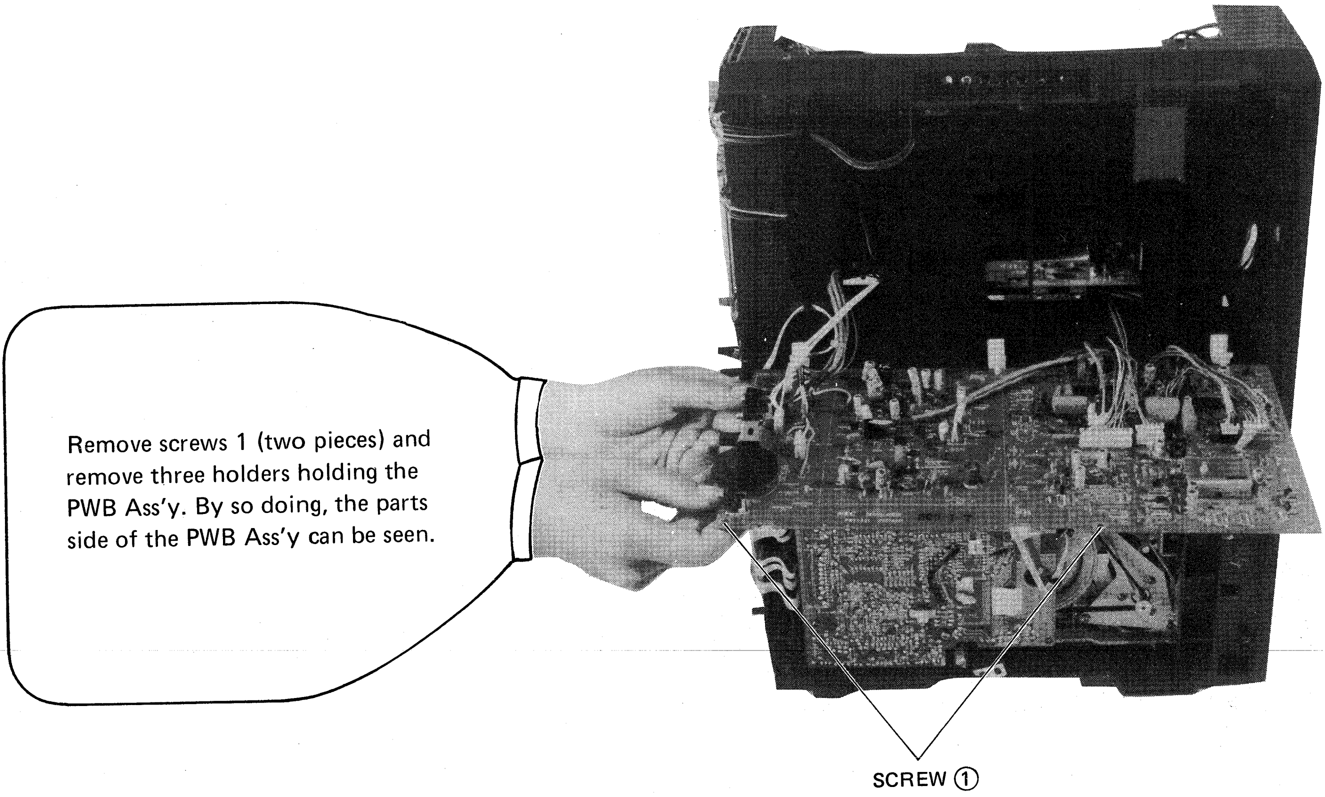
1-3. LOCATION OF PARTS AND CONTROLS

1. REGULATOR PWB ASS'Y (PWV-438)



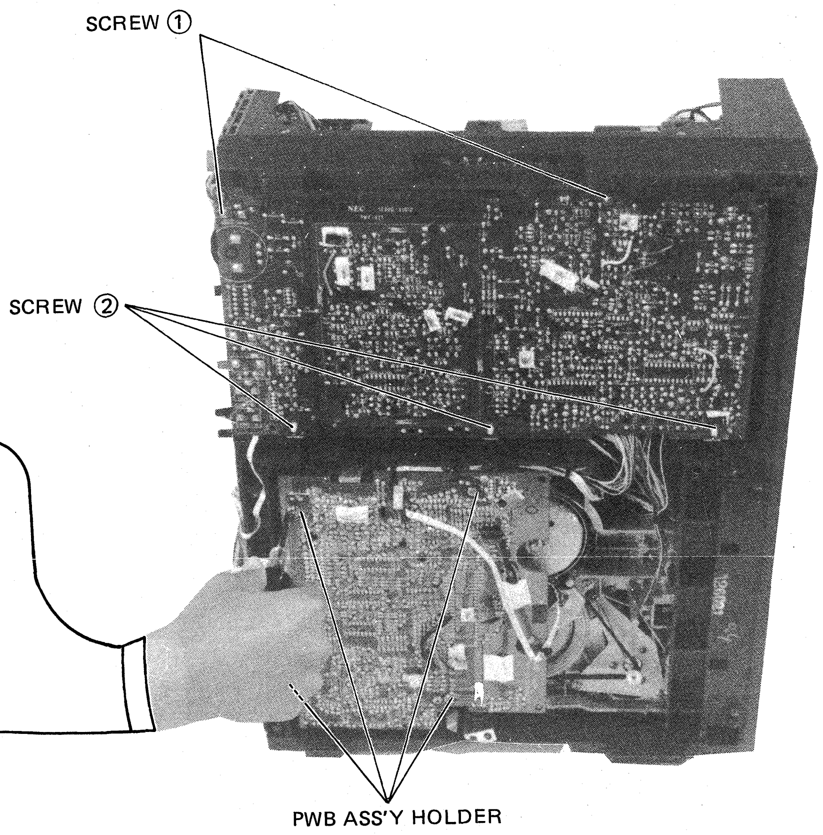
Remove connectors CN1 – CN12 and dismount the PWB Ass'y by extracting it upward.

2. SERVO/AUDIO PWB ASS'Y (PWV-421)



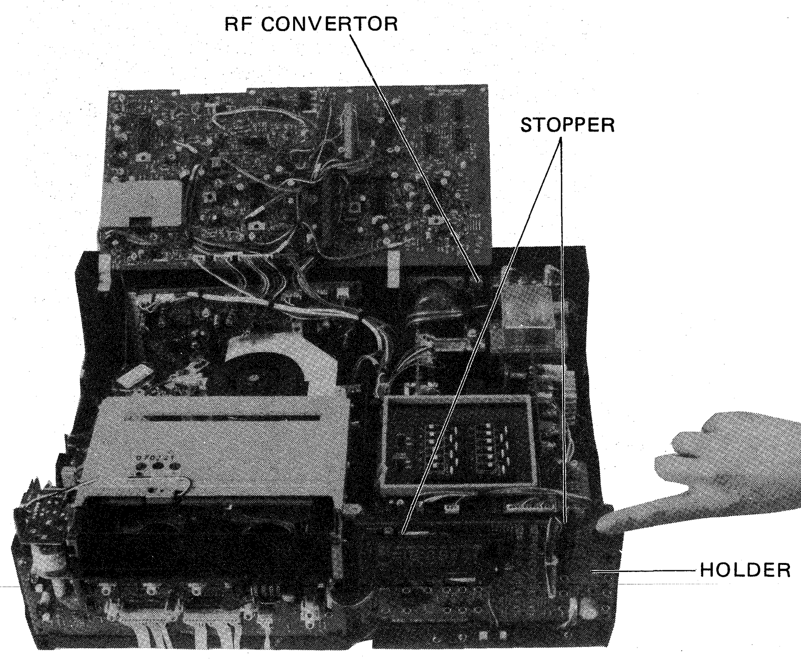
Remove screws 1 (two pieces) and remove three holders holding the PWB Ass'y. By so doing, the parts side of the PWB Ass'y can be seen.

3. SYSCON PWB ASS'Y (PWV-423)


SCREW ①
SCREW ②
PWB ASS'Y HOLDER

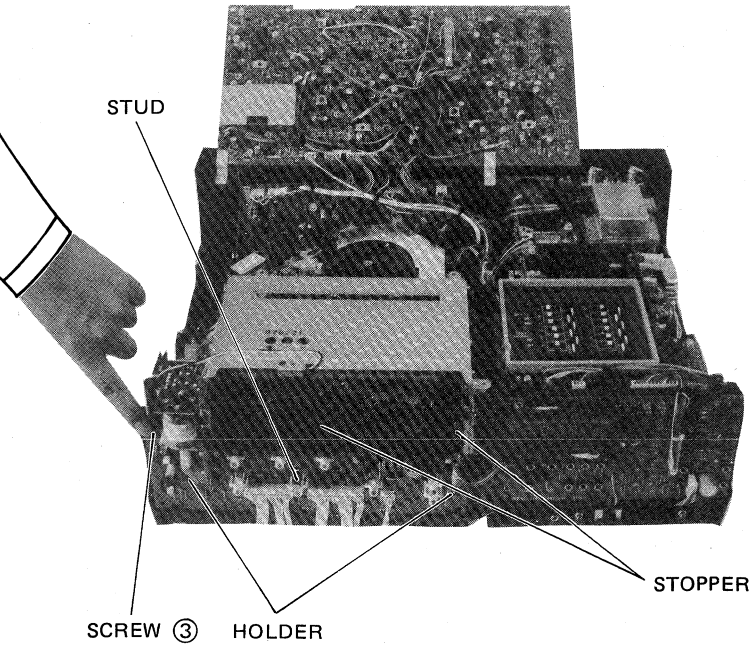
Remove screws 2 (four pieces) and also remove connectors CN2 and CN3 from the Function PWB Ass'y to dismount the PWB Ass'y.

4. TIMER PWB ASS'Y (PWV-425)


RF CONVERTOR
STOPPER
HOLDER

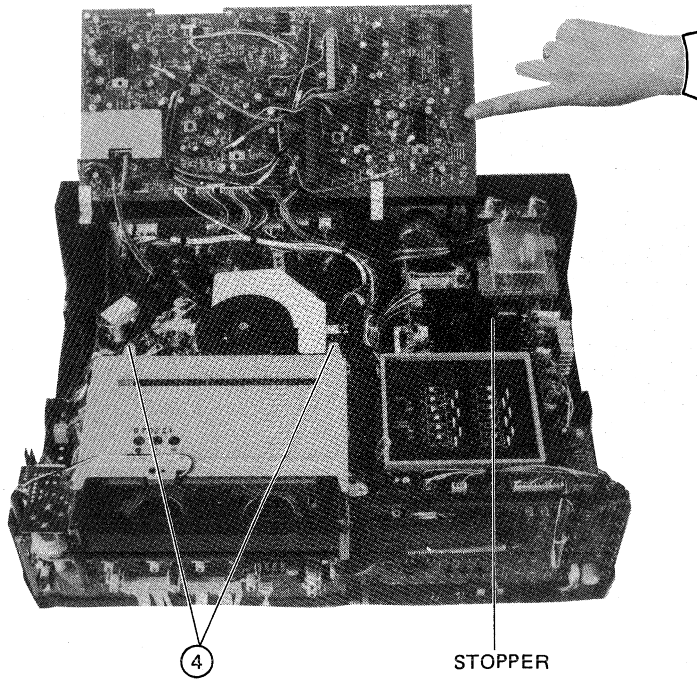
Dismount the front panel and remove terminal of CN1. Then remove the stopper at two points holding the timer PWB ass'y to take out the PWB.
When mounting the PWB ass'y, mount it with the hole on the PWB ass'y set to the protrusion on the PWB mounting bracket.

5. FUNCTION PWB ASS'Y (PWV-422)



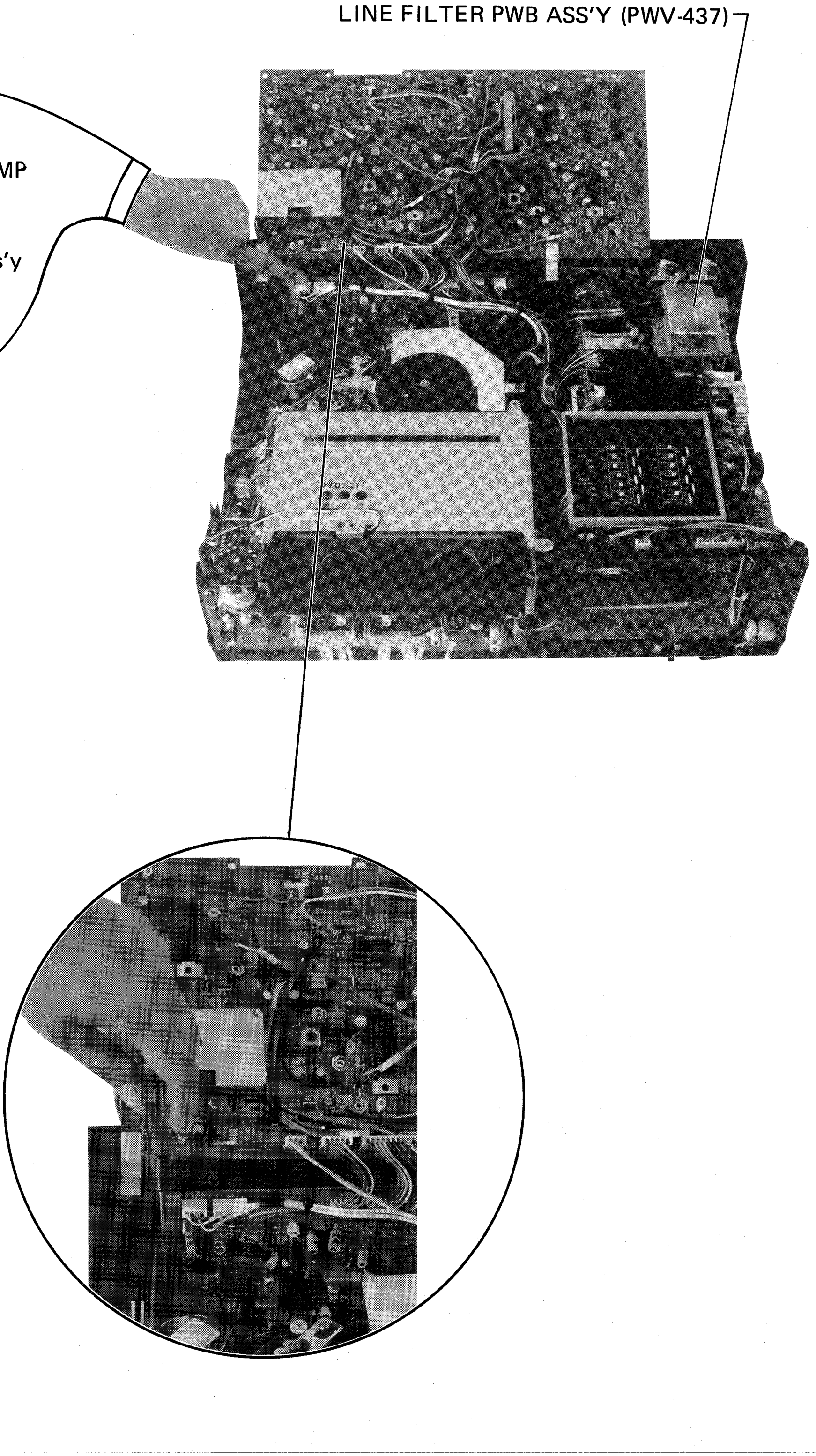
Take out the cassette house and then remove screw 3 and the stud. Next, remove connectors CN1, CN6, and CN4 and the stoppers holding the PWB ass'y to dismount the PWB ass'y. To mount the PWB ass'y, do so with the protrusion of the bracket to the two holes on the PWB ass'y.

6. CHROMA/PRE AMP PWB ASS'Y (PWV-435)



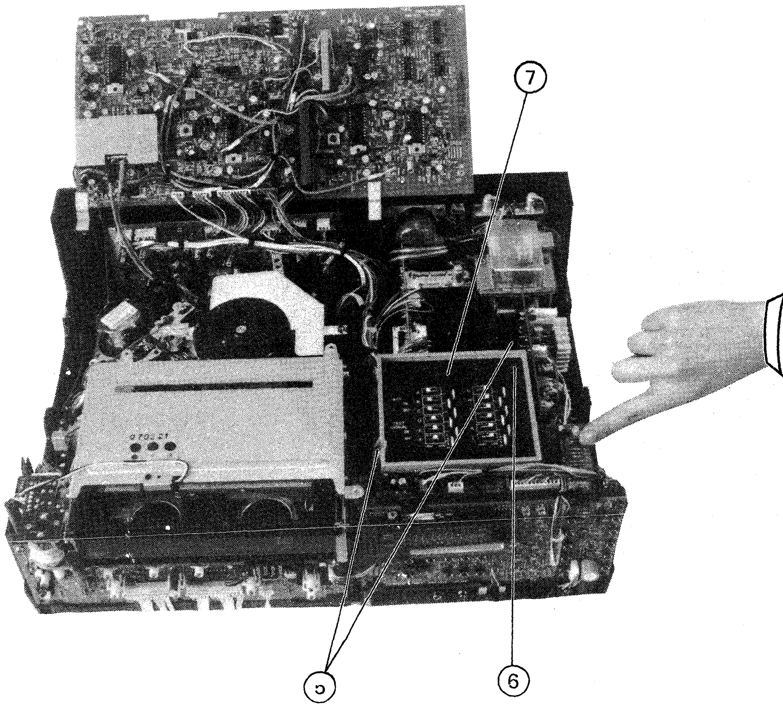
Remove screws 4 (two pieces) from the cassette house and swing open the PWB ass'y to the side of the rear panel. By so doing, the parts mounted side can be seen.

7. Y. PROCESS PWB ASS'Y (PWV-434)


LINE FILTER PWB ASS'Y (PWV-437)

Swing open the CHROMA/PRE AMP Ass'y to the side of rear panel and remove the screws for the bracket holding the Y. PROCESS PWB Ass'y using a screwdriver. Then pull the Y. PROCESS PWB Ass'y upward.

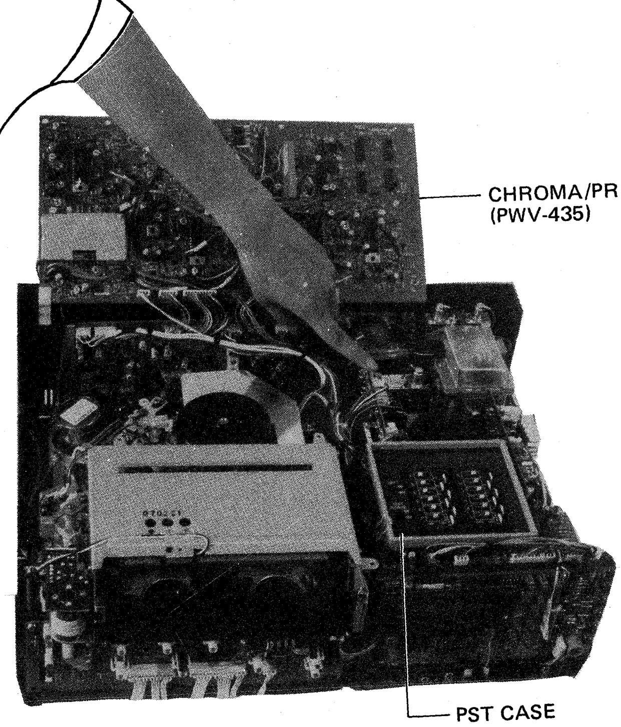
8. PST PWB ASS'Y (PWV-427)

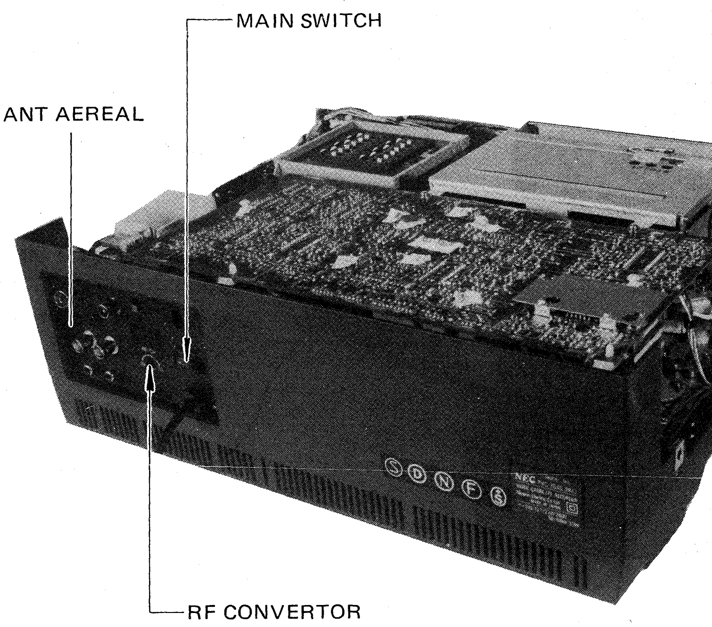


Remove screws 5 (two pieces) to dismount the case. Then remove one screw 6 and the stopper securing the PWB Ass'y.

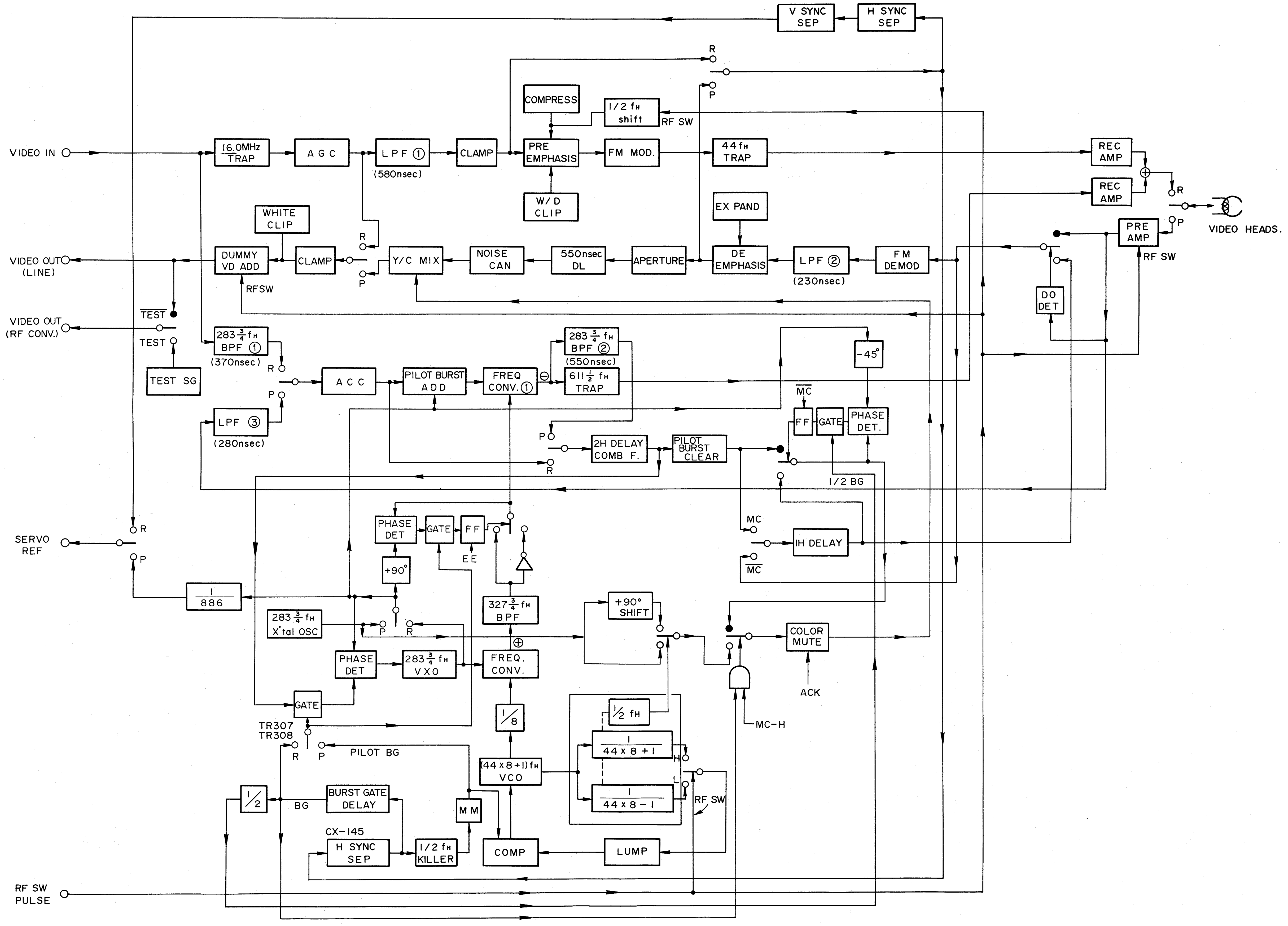
9. TU-VIF PWB ASS'Y (PWV-436)

Dismount the case from the top of the CHROMA/PRE AMP PWB Ass'y and the PST PWB Ass'y and pull TU-VIF PWB Ass'y upward. By so doing, each terminal can be checked.

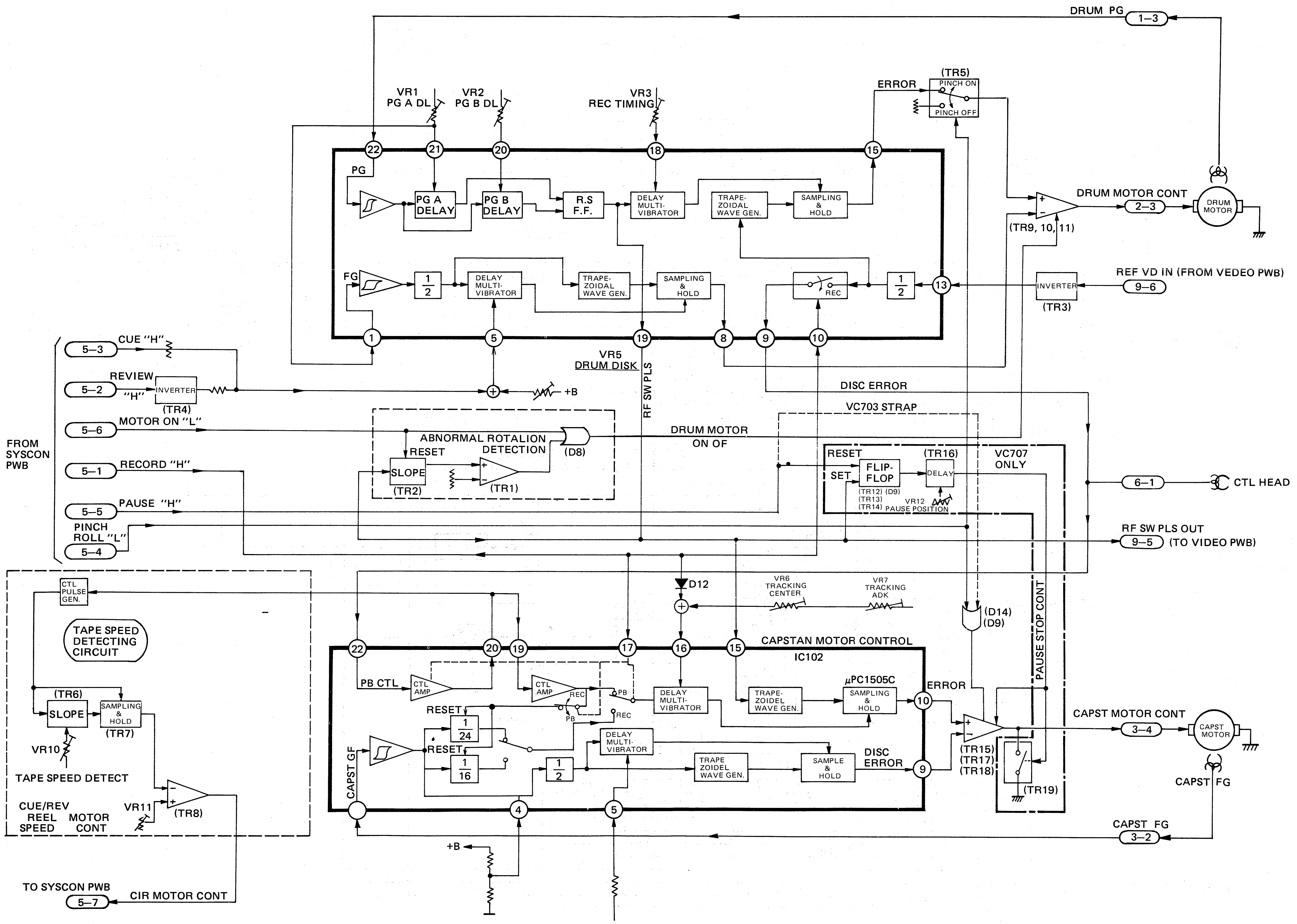

CHROMA/PREAMP
(PWV-435)
PST CASE


MAIN SWITCH
ANT AEREAL
RF CONVERTOR

VIDEO SYSTEM BLOCK DIAGRAM

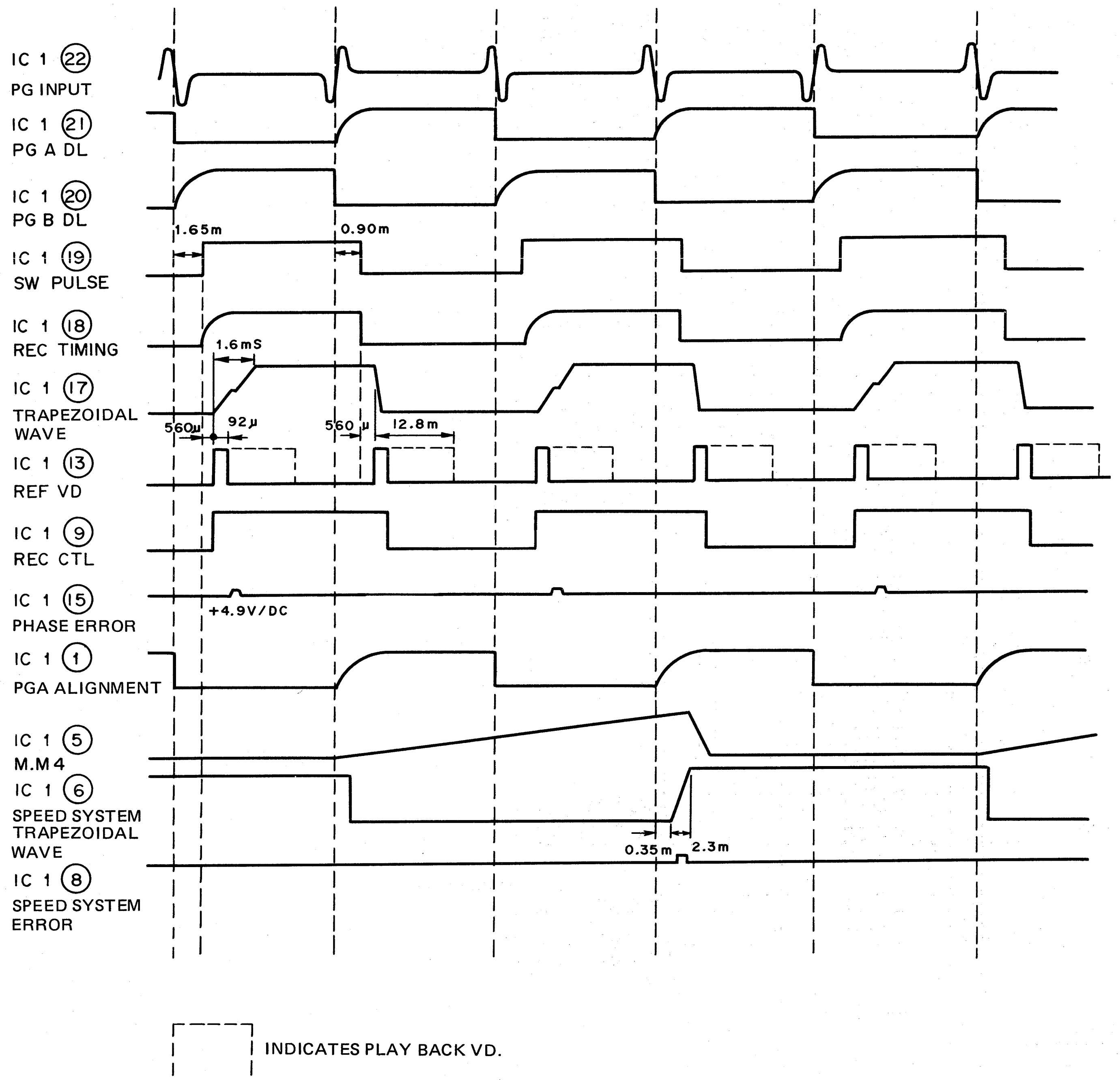

VIDEO IN
VIDEO OUT (LINE)
VIDEO OUT (RF CONV.)
SERVO REF
RF SW PULSE
VIDEO HEADS.
V SYNC SEP
H SYNC SEP
6.0MHz TRAP
AGC
LPF ① (580nsec)
CLAMP
COMPRESS
1/2 fH shift
RF SW
PRE EMPHASIS
W/D CLIP
FM MOD.
44fH TRAP
REC AMP
REC AMP
PRE AMP
EX PAND
WHITE CLIP
DUMMY VD ADD
RFSW
CLAMP
Y/C MIX
NOISE CAN
550nsec DL
APERTURE
DE EMPHASIS
LPF ② (230nsec)
FM DEMOD
DO DET
TEST
TEST
TEST SG
283 3/4 fH BPF ① (370nsec)
LPF ③ (280nsec)
ACC
PILOT BURST ADD
FREQ CONV. ①
283 3/4 fH BPF ② (550nsec)
611 1/2 fH TRAP
-45°
MC
FF
GATE
PHASE DET.
2H DELAY COMB F.
PILOT BURST CLEAR
1/2 BG
MC
IH DELAY
MC
PHASE DET
GATE
FF
EE
+90°
327 3/4 fH BPF
+90° SHIFT
COLOR MUTE
ACK
MC-H
1/886
283 3/4 fH X'tal OSC
PHASE DET
283 3/4 fH VXO
FREQ. CONV.
GATE
1/8
TR307
TR308
PILOT BG
(44x8+1)fH VCO
1/2 fH
1/(44x8+1)
1/(44x8-1)
H
L
RF SW
1/2
BG
BURST GATE DELAY
MM
CX-145
H SYNC SEP
1/2 fH KILLER
COMP
LUMP
R
P

CAPSTAN & DRUM SERVO BLOCK DIAGRAM


DRUM PG
1–3
VR1
PG A DL
VR2
PG B DL
VR3
REC TIMING
ERROR
(TR5)
PINCH ON
PINCH OFF
22
21
20
18
15
PG
PG A
DELAY
PG B
DELAY
R.S
F.F.
DELAY
MULTI-
VIBRATOR
TRAPE-
ZOIDAL
WAVE GEN.
SAMPLING
&
HOLD
DRUM MOTOR CONT
2–3
DRUM
MOTOR
(TR9, 10, 11)
FG
1
2
DELAY
MULTI-
VIBRATOR
TRAPE-
ZOIDAL
WAVE GEN.
SAMPLING
&
HOLD
REC
1
2
13
INVERTER
(TR3)
REF VD IN (FROM VEDEO PWB)
9–6
1
5
19
8
9
10
VR5
DRUM DISK
RF SW PLS
DISC ERROR
VC703 STRAP
5–3
CUE "H"
REVIEW
5–2
"H"
INVERTER
(TR4)
+B
5–6
MOTOR ON "L"
ABNORMAL ROTALION
DETECTION
RESET
SLOPE
(TR2)
(TR1)
(D8)
DRUM MOTOR
ON OF
FROM
SYSCON
PWB
5–1
RECORD "H"
RESET
SET
FLIP-
FLOP
(TR16)
DELAY
(TR12) (D9)
(TR13)
(TR14)
VR12
PAUSE POSITION
VC707
ONLY
6–1
CTL HEAD
5–5
PAUSE "H"
PINCH
ROLL "L"
5–4
RF SW PLS OUT
9–5
(TO VIDEO PWB)
CTL
PULSE
GEN.
TAPE SPEED
DETECTING
CIRCUIT
D12
VR6
TRACKING
CENTER
VR7
TRACKING
ADK
(D14)
(D9)
PAUSE STOP CONT
22
20
19
17
16
15
CAPSTAN MOTOR CONTROL
IC102
μPC1505C
PB CTL
CTL
AMP
CTL
AMP
REC
PB
PB
REC
DELAY
MULTI-
VIBRATOR
TRAPE-
ZOIDEL
WAVE GEN.
SAMPLING
&
HOLD
ERROR
10
RESET
1
24
RESET
1
16
1
2
DELAY
MULTI-
VIBRATOR
TRAPE
ZOIDEL
WAVE GEN.
SAMPLE
&
HOLD
DISC
ERROR
9
CAPST GF
4
5
(TR15)
(TR17)
(TR18)
(TR19)
CAPST MOTOR CONT
3–4
CAPST
MOTOR
CAPST FG
CAPST FG
3–2
(TR6)
SLOPE
SAMPLING
&
HOLD
(TR7)
VR10
TAPE SPEED DETECT
CUE/REV
REEL MOTOR
SPEED CONT
VR11
(TR8)
+B
TO SYSCON PWB
5–7
CIR MOTOR CONT

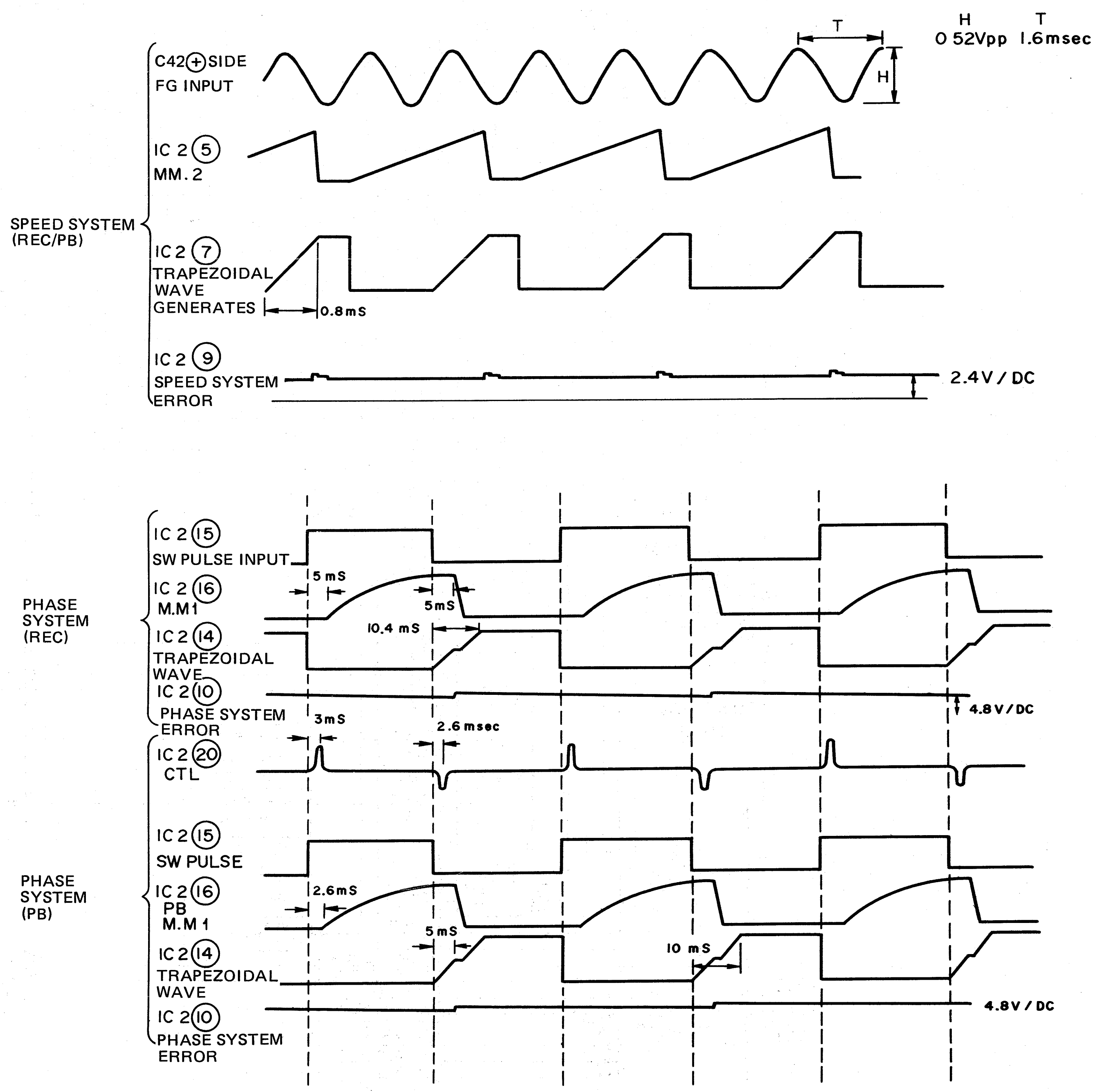
DRUM SERVO TIMING CHART

Drum servo timing chart

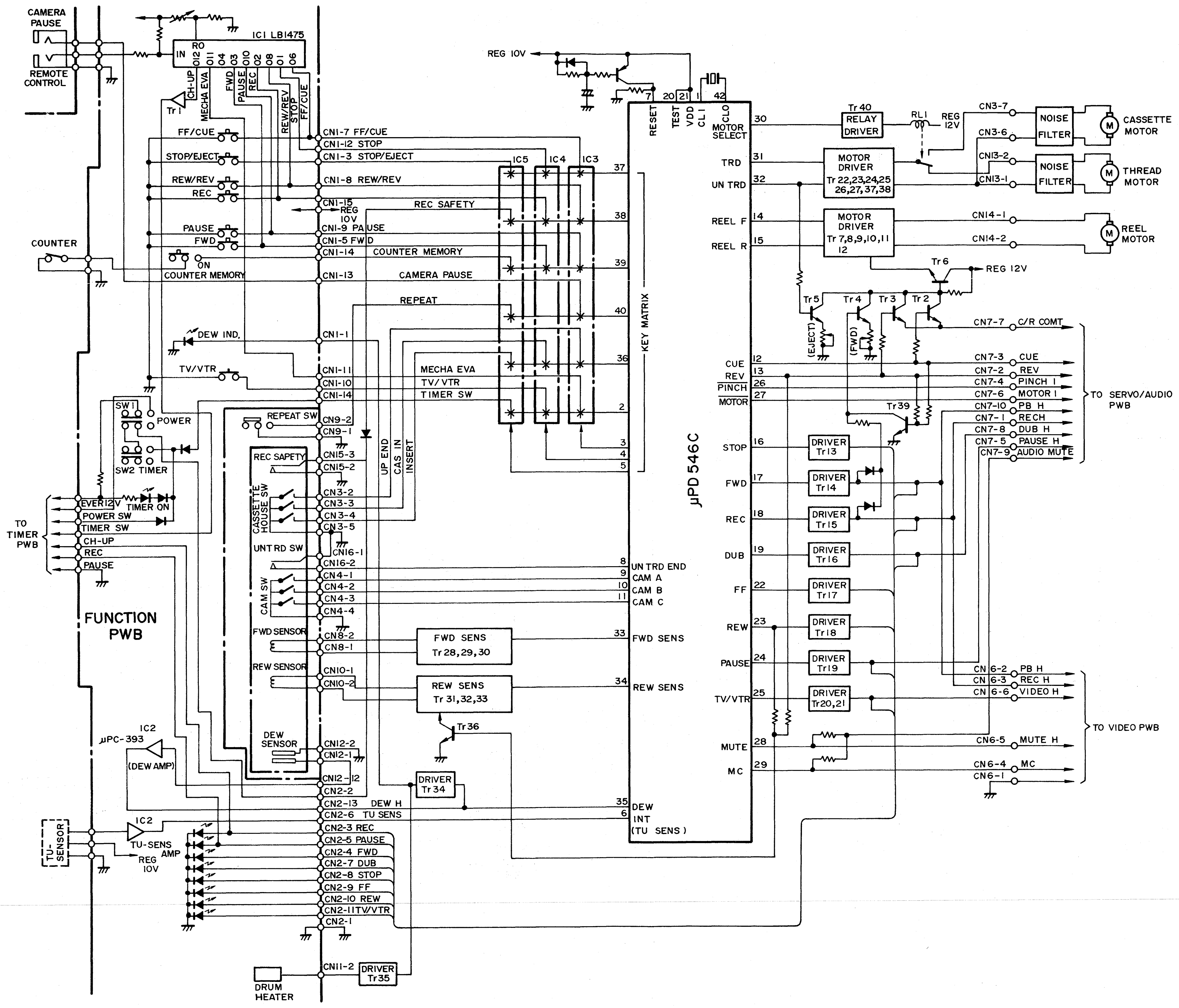

IC 1 ㉒
PG INPUT
IC 1 ㉑
PG A DL
IC 1 ⑳
PG B DL
1.65m
0.90m
IC 1 ⑲
SW PULSE
IC 1 ⑱
REC TIMING
1.6mS
IC 1 ⑰
TRAPEZOIDAL
WAVE
560μ
92μ
560 μ
12.8m
IC 1 ⑬
REF VD
IC 1 ⑨
REC CTL
IC 1 ⑮
PHASE ERROR
+4.9V/DC
IC 1 ①
PGA ALIGNMENT
IC 1 ⑤
M.M4
IC 1 ⑥
SPEED SYSTEM
TRAPEZOIDAL
WAVE
0.35m
2.3m
IC 1 ⑧
SPEED SYSTEM
ERROR
INDICATES PLAY BACK VD.

CAPSTAN SERVO TIMING CHART

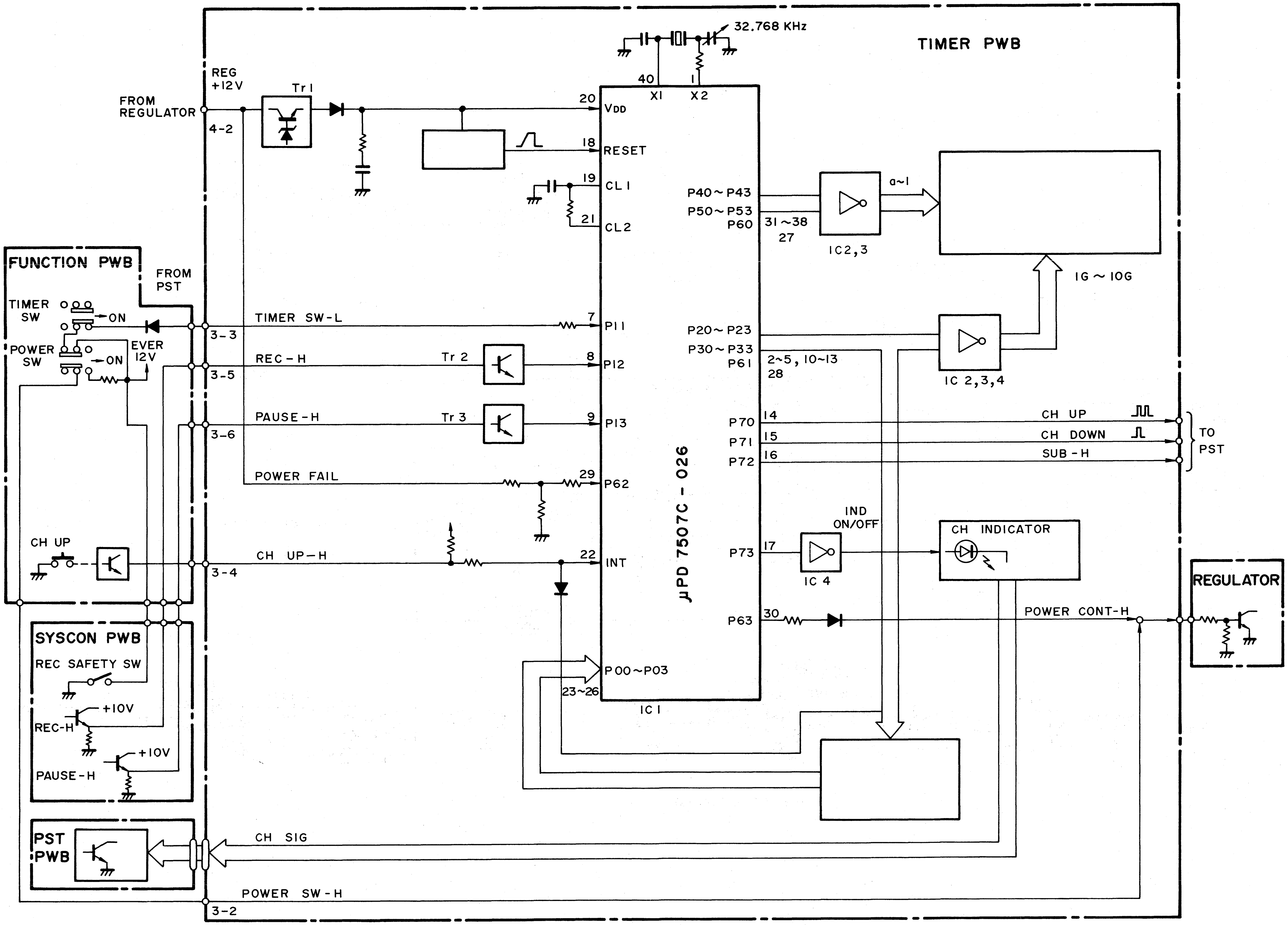
Capstan servo timing chart


T
H
T
0 52Vpp
1.6msec
C42⊕SIDE
FG INPUT
H
SPEED SYSTEM
(REC/PB)
IC 2 ⑤
MM.2
IC2 ⑦
TRAPEZOIDAL
WAVE
GENERATES
0.8mS
IC 2 ⑨
SPEED SYSTEM
ERROR
2.4V / DC
PHASE
SYSTEM
(REC)
IC 2 ⑮
SW PULSE INPUT
IC 2 ⑯
M.M1
5 mS
5mS
10.4 mS
IC2 ⑭
TRAPEZOIDAL
WAVE
IC 2 ⑩
PHASE SYSTEM
ERROR
4.8V/DC
3mS
2.6msec
IC 2 ⑳
CTL
PHASE
SYSTEM
(PB)
IC 2 ⑮
SW PULSE
IC 2 ⑯
PB
M.M1
2.6mS
5mS
10 mS
IC2 ⑭
TRAPEZOIDAL
WAVE
IC 2 ⑩
PHASE SYSTEM
ERROR
4.8V/DC

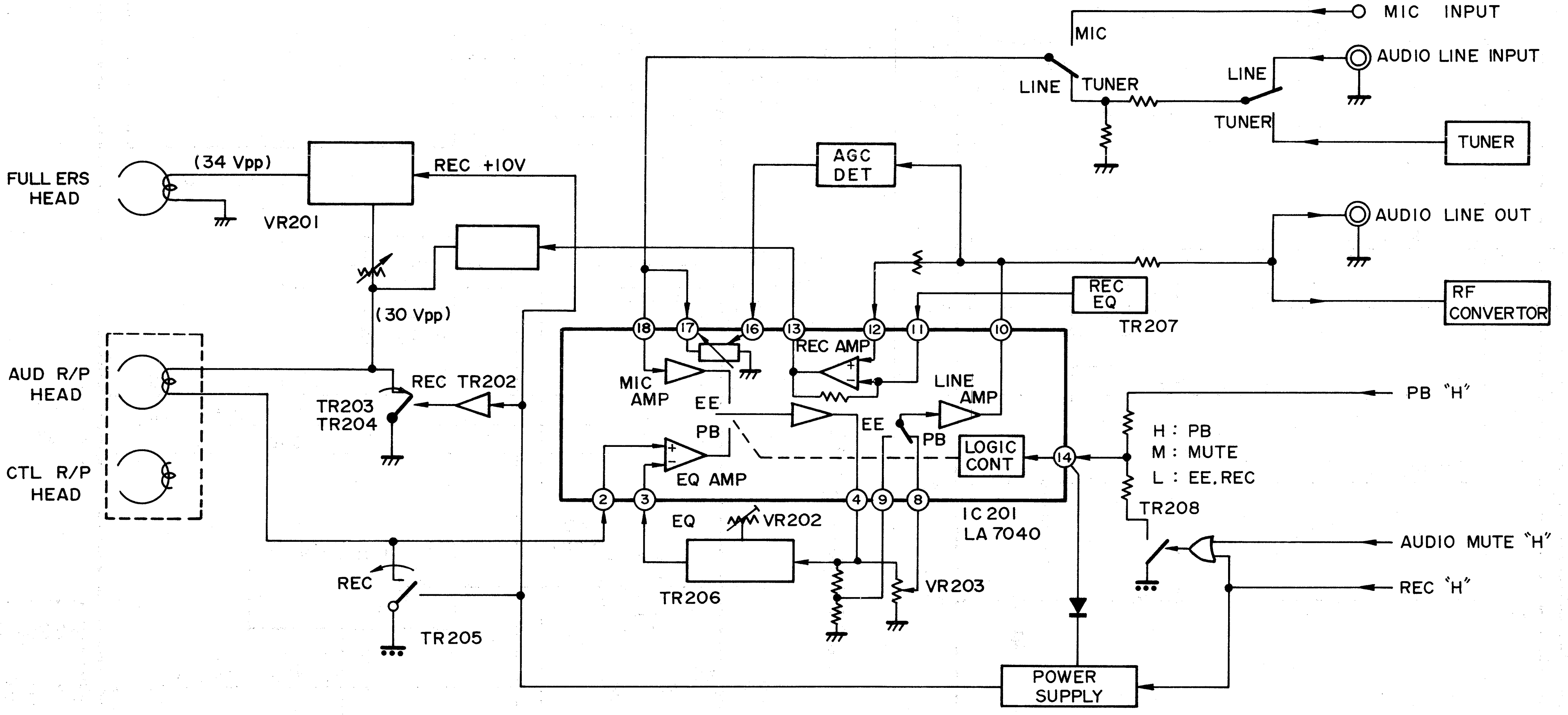
SYSTEM CONTROL BLOCK DIAGRAM

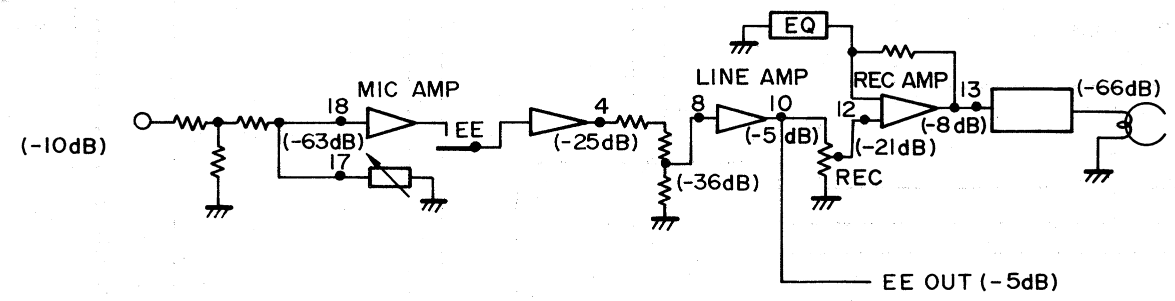

CAMERA PAUSE
REMOTE CONTROL
IC1 LB1475
IN
RO
CH-UP
MECHA EVA
FWD
PAUSE
REC
REW/REV
STOP
FF/CUE
Tr1
FF/CUE
STOP/EJECT
REW/REV
REC
PAUSE
FWD
COUNTER
ON
COUNTER MEMORY
DEW IND.
TV/VTR
SW1
POWER
SW2 TIMER
TO TIMER PWB
EVER 12V
TIMER ON
POWER SW
TIMER SW
CH-UP
REC
PAUSE
FUNCTION PWB
IC2
µPC-393
(DEW AMP)
TU-SENSOR
IC2
TU-SENS AMP
REG 10V
CN1-7 FF/CUE
CN1-12 STOP
CN1-3 STOP/EJECT
CN1-8 REW/REV
CN1-15
REG 10V
REC SAFETY
CN1-9 PAUSE
CN1-5 FWD
CN1-14 COUNTER MEMORY
CN1-13 CAMERA PAUSE
REPEAT
CN1-1
CN1-11 MECHA EVA
CN1-10 TV/VTR
CN1-14 TIMER SW
REPEAT SW
CN9-2
CN9-1
REC SAFETY
CN15-3
CN15-2
UP END
CAS IN
INSERT
CASSETTE HOUSE SW
CN3-2
CN3-3
CN3-4
CN3-5
UNTRD SW
CN16-1
CN16-2
CAM SW
CN4-1
CN4-2
CN4-3
CN4-4
FWD SENSOR
CN8-2
CN8-1
REW SENSOR
CN10-1
CN10-2
DEW SENSOR
CN12-2
CN12-1
CN12-12
CN2-2
CN2-13 DEW H
CN2-6 TU SENS
CN2-3 REC
CN2-5 PAUSE
CN2-4 FWD
CN2-7 DUB
CN2-8 STOP
CN2-9 FF
CN2-10 REW
CN2-11 TV/VTR
CN2-1
CN11-2
DRIVER Tr35
DRUM HEATER
IC5
IC4
IC3
KEY MATRIX
FWD SENS Tr28,29,30
REW SENS Tr31,32,33
Tr36
DRIVER Tr34
REG 10V
µPD 546C
RESET
TEST
VDD
CL1
CL0
7
20
21
1
42
37
38
39
40
36
2
3
4
5
8 UN TRD END
9 CAM A
10 CAM B
11 CAM C
33 FWD SENS
34 REW SENS
35 DEW
6 INT (TU SENS)
MOTOR SELECT 30
TRD 31
UN TRD 32
REEL F 14
REEL R 15
CUE 12
REV 13
PINCH 26
MOTOR 27
STOP 16
FWD 17
REC 18
DUB 19
FF 22
REW 23
PAUSE 24
TV/VTR 25
MUTE 28
MC 29
Tr40 RELAY DRIVER
RL1
REG 12V
MOTOR DRIVER Tr22,23,24,25 26,27,37,38
MOTOR DRIVER Tr7,8,9,10,11 12
CN3-7
CN3-6
CN13-2
CN13-1
NOISE FILTER
NOISE FILTER
CASSETTE MOTOR
THREAD MOTOR
CN14-1
CN14-2
REEL MOTOR
Tr6
REG 12V
Tr5
Tr4
Tr3
Tr2
(EJECT)
(FWD)
Tr39
DRIVER Tr13
DRIVER Tr14
DRIVER Tr15
DRIVER Tr16
DRIVER Tr17
DRIVER Tr18
DRIVER Tr19
DRIVER Tr20,21
CN7-7 C/R COMT
CN7-3 CUE
CN7-2 REV
CN7-4 PINCH I
CN7-6 MOTOR I
CN7-10 PB H
CN7-1 RECH
CN7-8 DUB H
CN7-5 PAUSE H
CN7-9 AUDIO MUTE
TO SERVO/AUDIO PWB
CN6-2 PB H
CN6-3 REC H
CN6-6 VIDEO H
CN6-5 MUTE H
CN6-4 MC
CN6-1
TO VIDEO PWB

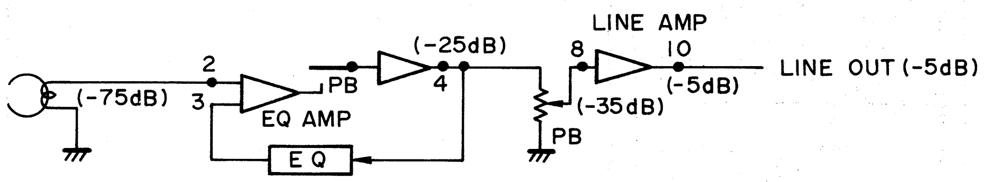
TIMER BLOCK DIAGRAM


TIMER PWB
32.768 KHz
40
1
X1
X2
FROM REGULATOR
REG +12V
4-2
Tr 1
20
VDD
18
RESET
19
CL 1
21
CL 2
P40～P43
P50～P53
P60
31～38
27
IC2,3
a～i
1G～10G
FUNCTION PWB
FROM PST
TIMER SW
ON
POWER SW
ON
EVER 12V
3-3
TIMER SW-L
7
P11
3-5
REC-H
Tr 2
8
P12
3-6
PAUSE-H
Tr 3
9
P13
POWER FAIL
29
P62
P20～P23
P30～P33
P61
2～5, 10～13
28
IC 2,3,4
P70
14
CH UP
P71
15
CH DOWN
P72
16
SUB-H
TO PST
μPD 7507C - 026
IND ON/OFF
P73
17
IC 4
CH INDICATOR
CH UP
3-4
CH UP-H
22
INT
P63
30
POWER CONT-H
REGULATOR
SYSCON PWB
REC SAFETY SW
+10V
REC-H
+10V
PAUSE-H
P00～P03
23～26
IC 1
PST PWB
CH SIG
POWER SW-H
3-2

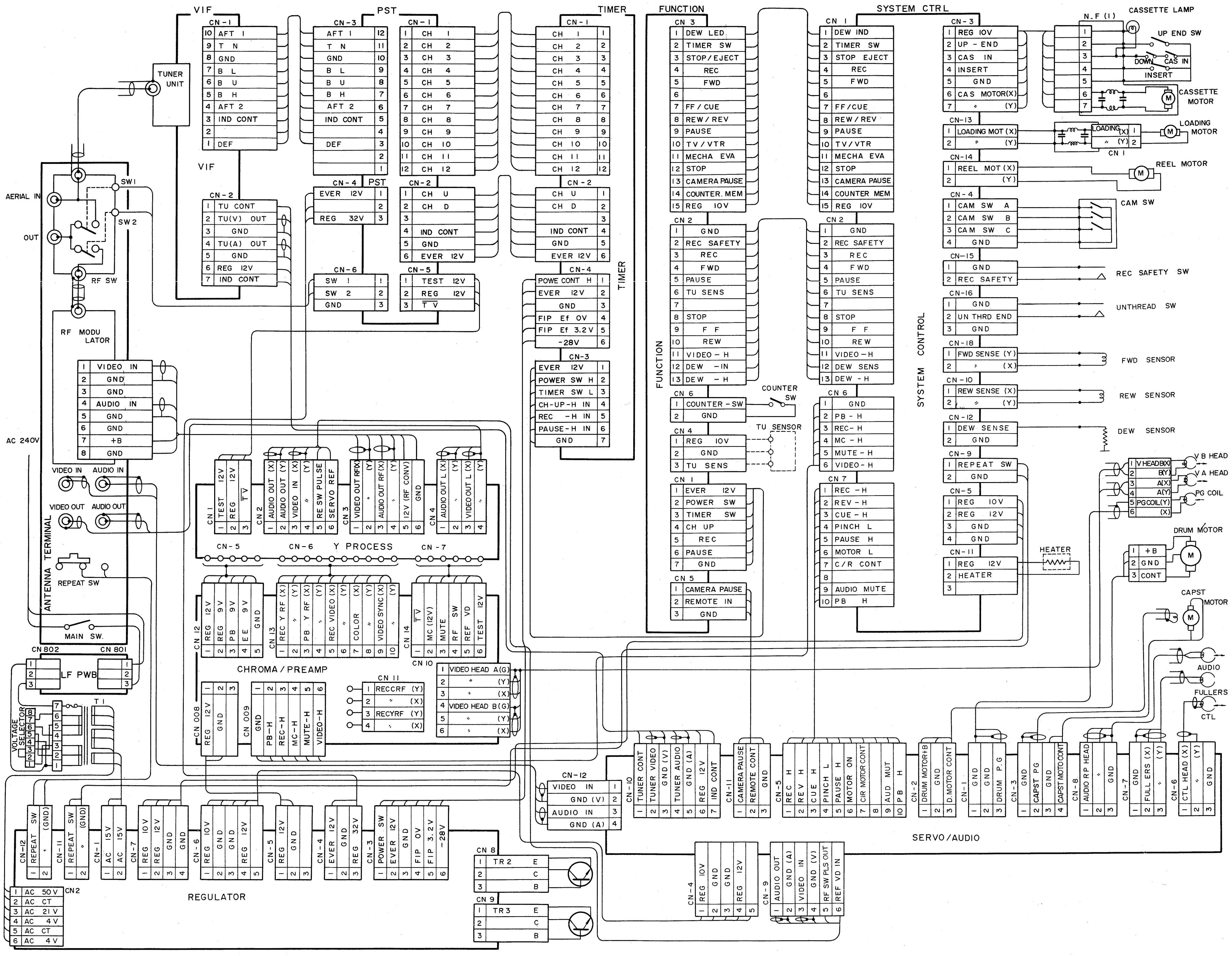
AUDIO BLOCK DIAGRAM


MIC INPUT
MIC
AUDIO LINE INPUT
LINE
TUNER
LINE
TUNER
TUNER
AGC DET
AUDIO LINE OUT
RF CONVERTOR
REC EQ
TR207
FULL ERS HEAD
(34 Vpp)
REC +10V
VR201
(30 Vpp)
AUD R/P HEAD
CTL R/P HEAD
REC TR202
TR203
TR204
18
17
16
13
12
11
10
MIC AMP
REC AMP
LINE AMP
EE
PB
EE
PB
EQ AMP
LOGIC CONT
14
2
3
4
9
8
IC201
LA7040
EQ
VR202
TR206
VR203
PB "H"
H : PB
M : MUTE
L : EE, REC
TR208
AUDIO MUTE "H"
REC "H"
REC
TR205
POWER SUPPLY


(-10dB)
MIC AMP
18
(-63dB)
17
EE
4
(-25dB)
(-36dB)
EQ
LINE AMP
8
10
(-5dB)
REC AMP
12
13
(-8dB)
(-21dB)
REC
(-66dB)
EE OUT (-5dB)

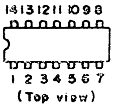

(-75dB)
2
3
EQ AMP
PB
EQ
(-25dB)
4
LINE AMP
8
10
(-5dB)
(-35dB)
PB
LINE OUT (-5dB)

FRAME WIRING

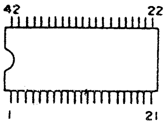

VIF
CN-1
10 AFT 1
9 T N
8 GND
7 B L
6 B U
5 B H
4 AFT 2
3 IND CONT
2
1 DEF
TUNER UNIT
PST
CN-3
AFT 1 12
T N 11
GND 10
B L 9
B U 8
B H 7
AFT 2 6
IND CONT 5
4
DEF 3
2
1
CN-1
1 CH 1
2 CH 2
3 CH 3
4 CH 4
5 CH 5
6 CH 6
7 CH 7
8 CH 8
9 CH 9
10 CH 10
11 CH 11
12 CH 12
TIMER
CN-1
CH 1 1
CH 2 2
CH 3 3
CH 4 4
CH 5 5
CH 6 6
CH 7 7
CH 8 8
CH 9 9
CH 10 10
CH 11 11
CH 12 12
VIF
CN-2
1 TU CONT
2 TU(V) OUT
3 GND
4 TU(A) OUT
5 GND
6 REG 12V
7 IND CONT
CN-4 PST
EVER 12V 1
2
REG 32V 3
CN-2
1 CH U
2 CH D
3
4 IND CONT
5 GND
6 EVER 12V
CN-2
CH U 1
CH D 2
3
IND CONT 4
GND 5
EVER 12V 6
CN-6
SW 1 1
SW 2 2
GND 3
CN-5
1 TEST 12V
2 REG 12V
3 TV
CN-4
POWE CONT H 1
EVER 12V 2
GND 3
FIP Ef OV 4
FIP Ef 3.2V 5
-28V 6
CN-3
EVER 12V 1
POWER SW H 2
TIMER SW L 3
CH-UP-H IN 4
REC -H IN 5
PAUSE-H IN 6
GND 7
TIMER
FUNCTION
CN 3
1 DEW LED
2 TIMER SW
3 STOP/EJECT
4 REC
5 FWD
6
7 FF/CUE
8 REW/REV
9 PAUSE
10 TV/VTR
11 MECHA EVA
12 STOP
13 CAMERA PAUSE
14 COUNTER. MEM
15 REG 10V
CN 2
1 GND
2 REC SAFETY
3 REC
4 FWD
5 PAUSE
6 TU SENS
7
8 STOP
9 F F
10 REW
11 VIDEO-H
12 DEW -IN
13 DEW -H
CN 6
1 COUNTER-SW
2 GND
COUNTER SW
CN 4
1 REG 10V
2 GND
3 TU SENS
TU SENSOR
CN 1
1 EVER 12V
2 POWER SW
3 TIMER SW
4 CH UP
5 REC
6 PAUSE
7 GND
CN 5
1 CAMERA PAUSE
2 REMOTE IN
3 GND
FUNCTION
SYSTEM CTRL
CN 1
1 DEW IND
2 TIMER SW
3 STOP EJECT
4 REC
5 FWD
6
7 FF/CUE
8 REW/REV
9 PAUSE
10 TV/VTR
11 MECHA EVA
12 STOP
13 CAMERA PAUSE
14 COUNTER MEM
15 REG 10V
CN 2
1 GND
2 REC SAFETY
3 REC
4 FWD
5 PAUSE
6 TU SENS
7
8 STOP
9 F F
10 REW
11 VIDEO-H
12 DEW SENS
13 DEW -H
CN 6
1 GND
2 PB-H
3 REC-H
4 MC-H
5 MUTE-H
6 VIDEO-H
CN 7
1 REC -H
2 REV-H
3 CUE-H
4 PINCH L
5 PAUSE H
6 MOTOR L
7 C/R CONT
8
9 AUDIO MUTE
10 PB H
SYSTEM CONTROL
CN-3
1 REG 10V
2 UP-END
3 CAS IN
4 INSERT
5 GND
6 CAS MOTOR(X)
7 〃 (Y)
N.F (1)
CASSETTE LAMP
UP END SW
DOWN
CAS IN
INSERT
CASSETTE MOTOR
CN-13
1 LOADING MOT (X)
2 〃 (Y)
LOADING (X) 1
〃 (Y) 2
CN 1
LOADING MOTOR
CN-14
1 REEL MOT (X)
2 (Y)
REEL MOTOR
CN-4
1 CAM SW A
2 CAM SW B
3 CAM SW C
4 GND
CAM SW
CN-15
1 GND
2 REC SAFETY
REC SAFETY SW
CN-16
1 GND
2 UN THRD END
3 GND
UNTHREAD SW
CN-18
1 FWD SENSE (Y)
2 〃 (X)
FWD SENSOR
CN-10
1 REW SENSE (X)
2 〃 (Y)
REW SENSOR
CN-12
1 DEW SENSE
2 GND
DEW SENSOR
CN-9
1 REPEAT SW
2 GND
CN-5
1 REG 10V
2 REG 12V
3 GND
4 GND
CN-11
1 REG 12V
2 HEATER
3
HEATER
1 V HEAD B(X)
2 B(Y)
3 A(X)
4 A(Y)
5 PG COIL(Y)
6 (X)
V B HEAD
V A HEAD
PG COIL
DRUM MOTOR
1 +B
2 GND
3 CONT
CAPST MOTOR
AUDIO
FULLERS
CTL
TUNER UNIT
AERIAL IN
OUT
SW1
SW2
RF SW
RF MODU LATOR
1 VIDEO IN
2 GND
3 GND
4 AUDIO IN
5 GND
6 GND
7 +B
8 GND
AC 240V
VIDEO IN
AUDIO IN
VIDEO OUT
AUDIO OUT
ANTENNA TERMINAL
REPEAT SW
MAIN SW.
CN 802
CN 801
LF PWB
VOLTAGE SELECTOR
T 1
CN 1
1 TEST 12V
2 REG 12V
3 TV
CN 2
1 AUDIO OUT (X)
2 AUDIO OUT (Y)
3 VIDEO IN (X)
4 〃 (Y)
5 RE SW PULSE
6 SERVO REF
CN 3
1 VIDEO OUT RF(X)
2 〃 (Y)
3 AUDIO OUT RF(X)
4 〃 (Y)
5 12V (RF CONV)
6 GND
CN 4
1 AUDIO OUT L (X)
2 〃 (Y)
3 VIDEO OUT L (X)
4 〃 (Y)
CN-5
CN-6
Y PROCESS
CN-7
CN 12
1 REG 12V
2 REG 9V
3 PB 9V
4 EE 9V
5 GND
CN 13
1 REC Y RF (X)
2 〃 (Y)
3 PB Y RF (X)
4 〃 (Y)
5 REC VIDEO (X)
6 〃 (Y)
7 COLOR (X)
8 〃 (Y)
9 VIDEO SYNC (X)
10 〃 (Y)
CN 14
1 TV
2 MC (12V)
3 MUTE
4 RF SW
5 REF VD
6 TEST 12V
CN 10
CHROMA / PREAMP
CN 008
1 REG 12V
2 GND
CN 009
1 GND
2 PB-H
3 REC-H
4 MC-H
5 MUTE-H
6 VIDEO-H
CN 11
1 RECCRF (Y)
2 〃 (X)
3 RECYRF (Y)
4 〃 (X)
1 VIDEO HEAD A(G)
2 〃 (Y)
3 〃 (X)
4 VIDEO HEAD B(G)
5 〃 (Y)
6 〃 (X)
CN-12
1 VIDEO IN
2 GND (V)
3 AUDIO IN
4 GND (A)
CN-12
1 REPEAT SW
2 〃 (GND)
CN-11
1 REPEAT SW
2 〃 (GND)
CN-1
1 AC 15V
2 AC 15V
CN-7
1 REG 10V
2 REG 12V
3 GND
4 GND
CN-6
1 REG 10V
2 GND
3 GND
4 REG 12V
5 GND
CN-5
1 REG 12V
2 GND
3 GND
CN-4
1 EVER 12V
2 GND
3 REG 32V
CN-3
1 POWER SW
2 EVER 12V
3 GND
4 FIP OV
5 FIP 3.2V
6 -28V
CN2
1 AC 50V
2 AC CT
3 AC 21V
4 AC 4V
5 AC CT
6 AC 4V
REGULATOR
CN 8
1 TR2 E
2 C
3 B
CN 9
1 TR3 E
2 C
3 B
CN-10
1 TUNER CONT
2 TUNER VIDEO
3 GND (V)
4 TUNER AUDIO
5 GND (A)
6 REG 12V
7 IND CONT
CN-11
1 CAMERA PAUSE
2 REMOTE CONT
3 GND
CN-5
1 REC H
2 REV H
3 CUE H
4 PINCH L
5 PAUSE H
6 MOTOR ON
7 CIR MOTOR CONT
8
9 AUD MUT
10 PB H
CN-2
1 DRUM MOTOR+B
2 GND
3 D.MOTOR CONT
CN-1
1 GND
2 GND
3 DRUM P.G
CN-3
1 GND
2 CAPST PG
3 GND
4 CAPST MOTO CONT
CN-8
1 AUDIO RP HEAD
2
3 GND
CN-7
1 GND
2 FULL ERS (X)
3 〃 (Y)
CN-6
1 CTL HEAD (X)
2 〃 (Y)
3 GND
SERVO/AUDIO
CN-4
1 REG 10V
2 GND
3 GND
4 REG 12V
5
CN-9
1 AUDIO OUT
2 GND (A)
3 VIDEO IN
4 GND (V)
5 RF SW PLS OUT
6 REF VD IN

TRANSISTOR BASE CONNECTION

HD74LS93P
HD74LS74AP
HD74LS10P
HA1124

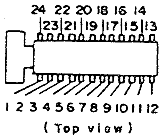

14 13 12 11 10 9 8
1 2 3 4 5 6 7
(Top view)

µPD546C-330

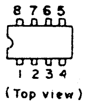


(EP View)

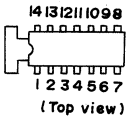
CX134A
CX136A
CX832


24 22 20 18 16 14
23 21 19 17 15 13
1 2 3 4 5 6 7 8 9 10 11 12
(Top view)

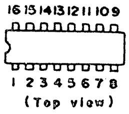
M58478P
LA7019
µPC393C


8 7 6 5
1 2 3 4
(Top view)

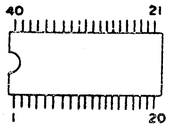
CX-150B


14 13 12 11 10 9 8
1 2 3 4 5 6 7
(Top view)

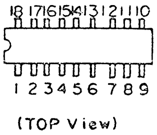
µPD4503BC
µPA80C
TA7607AP


16 15 14 13 12 11 10 9
1 2 3 4 5 6 7 8
(Top view)

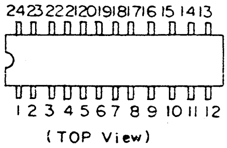
µPD7507C-026



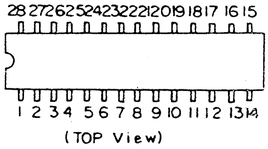
LA-7040


18 17 16 15 14 13 12 11 10
1 2 3 4 5 6 7 8 9
(TOP View)

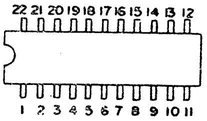
MPC1363C


24 23 22 21 20 19 18 17 16 15 14 13
1 2 3 4 5 6 7 8 9 10 11 12
(TOP View)

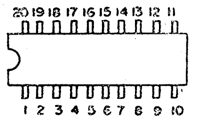
MPC1390C
LA7020
LA7025


28 27 26 25 24 23 22 21 20 19 18 17 16 15
1 2 3 4 5 6 7 8 9 10 11 12 13 14
(TOP View)

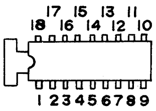
µPC1504C
µPC1505C


22 21 20 19 18 17 16 15 14 13 12
1 2 3 4 5 6 7 8 9 10 11

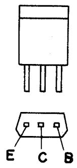
LB1475


20 19 18 17 16 15 14 13 12 11
1 2 3 4 5 6 7 8 9 10

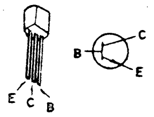
CX145


17 15 13 11
18 16 14 12 10
1 2 3 4 5 6 7 8 9

2SB733K



2SC388



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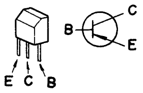

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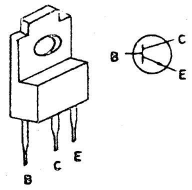
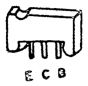
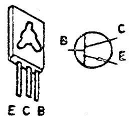


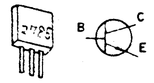
2SD637



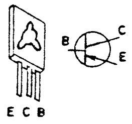
2SD882P
2SD985



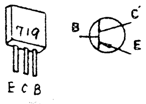
2SC1317
2SC2785



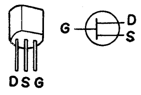
2SB772



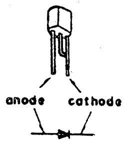
2SA719
2SA1175



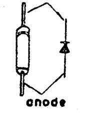
2SK152



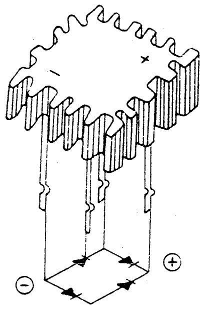
µPC574J


anode
cathode

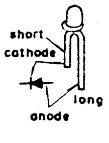
RV 35V
RD 5.6V
10 E2
RD 6.2EB
RD 9.1EB
RD 3.0EB
IS953


cathode
anode

D5FB10

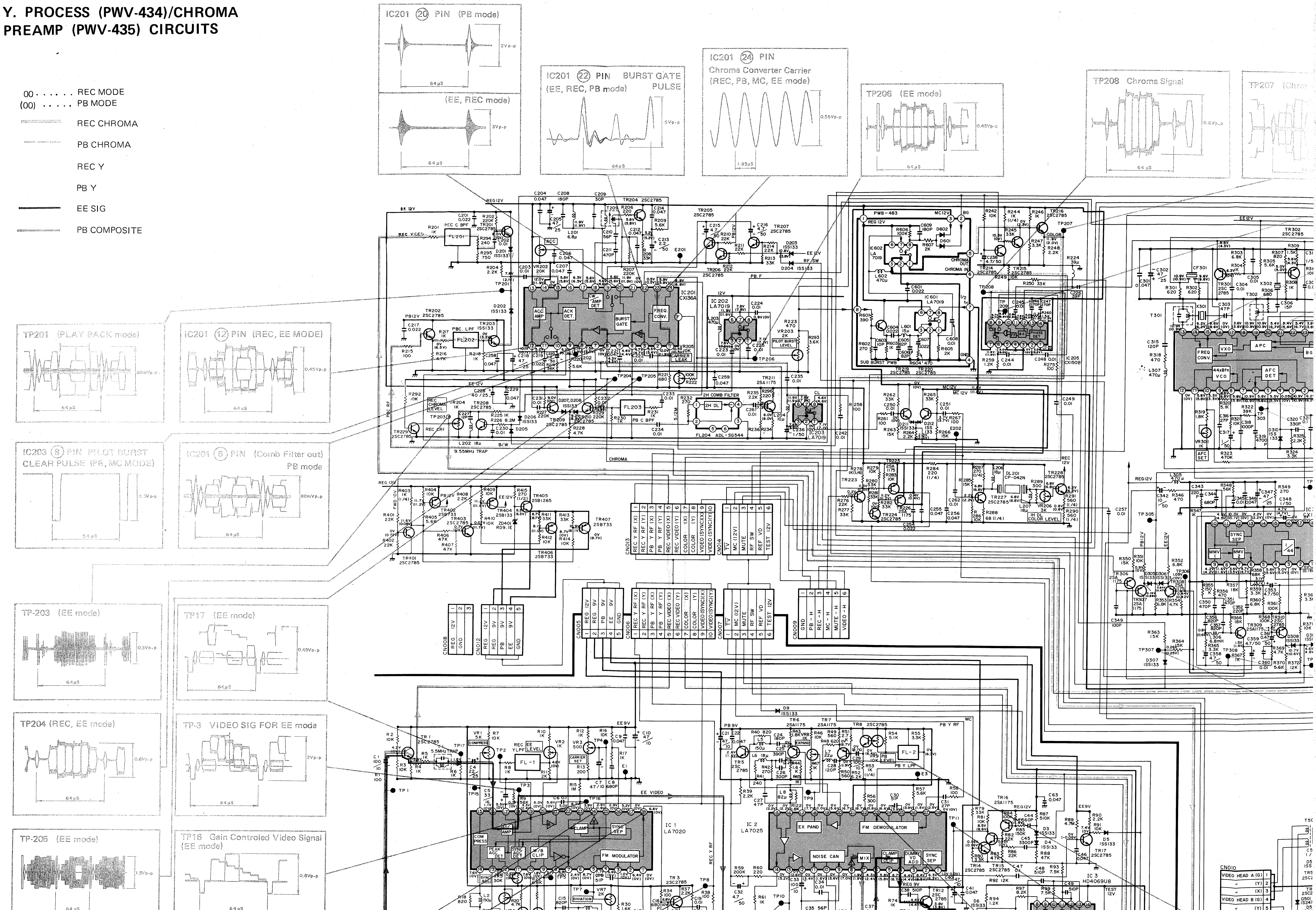


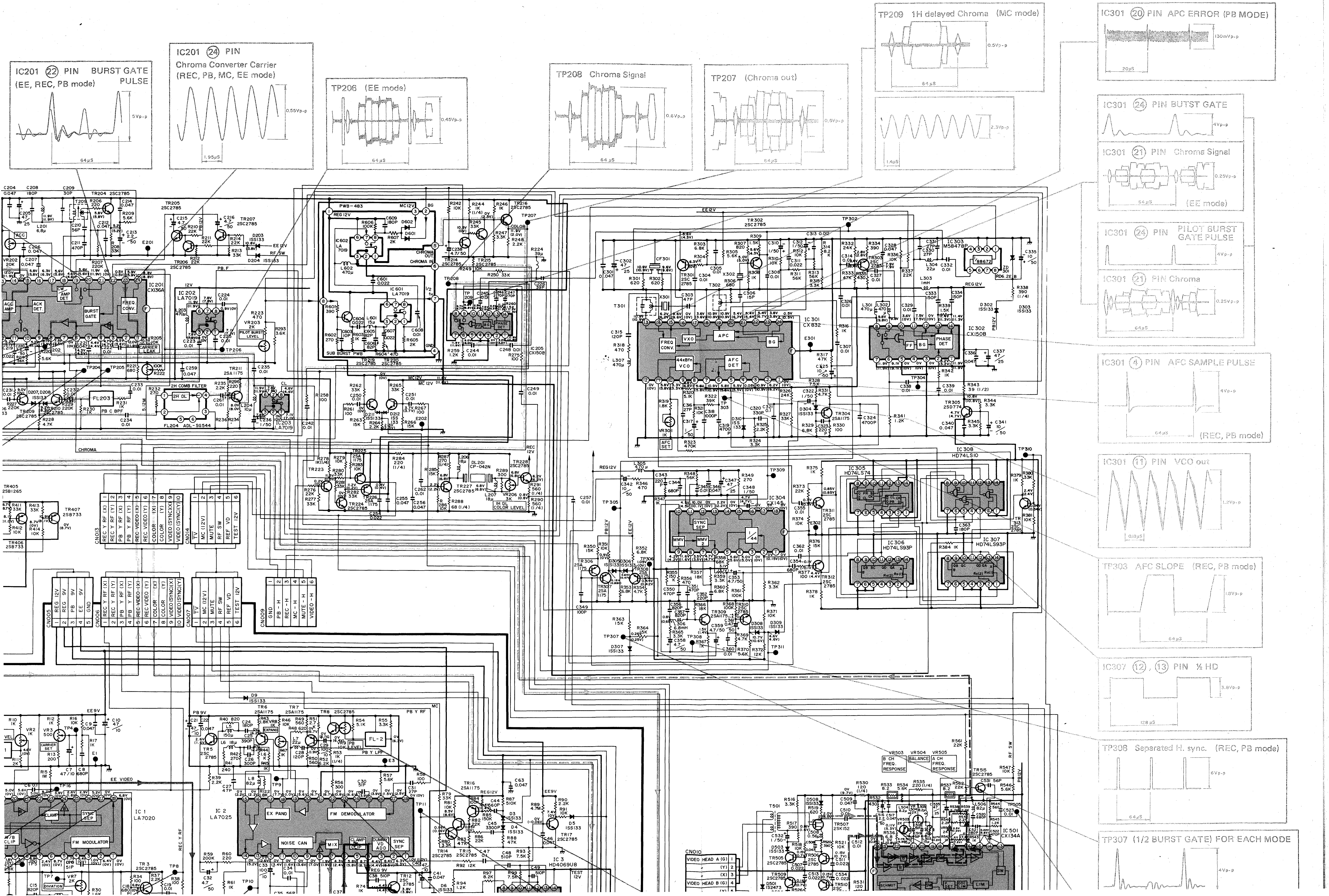
TLG123A, TLG113A
TLR123A, TLR113A

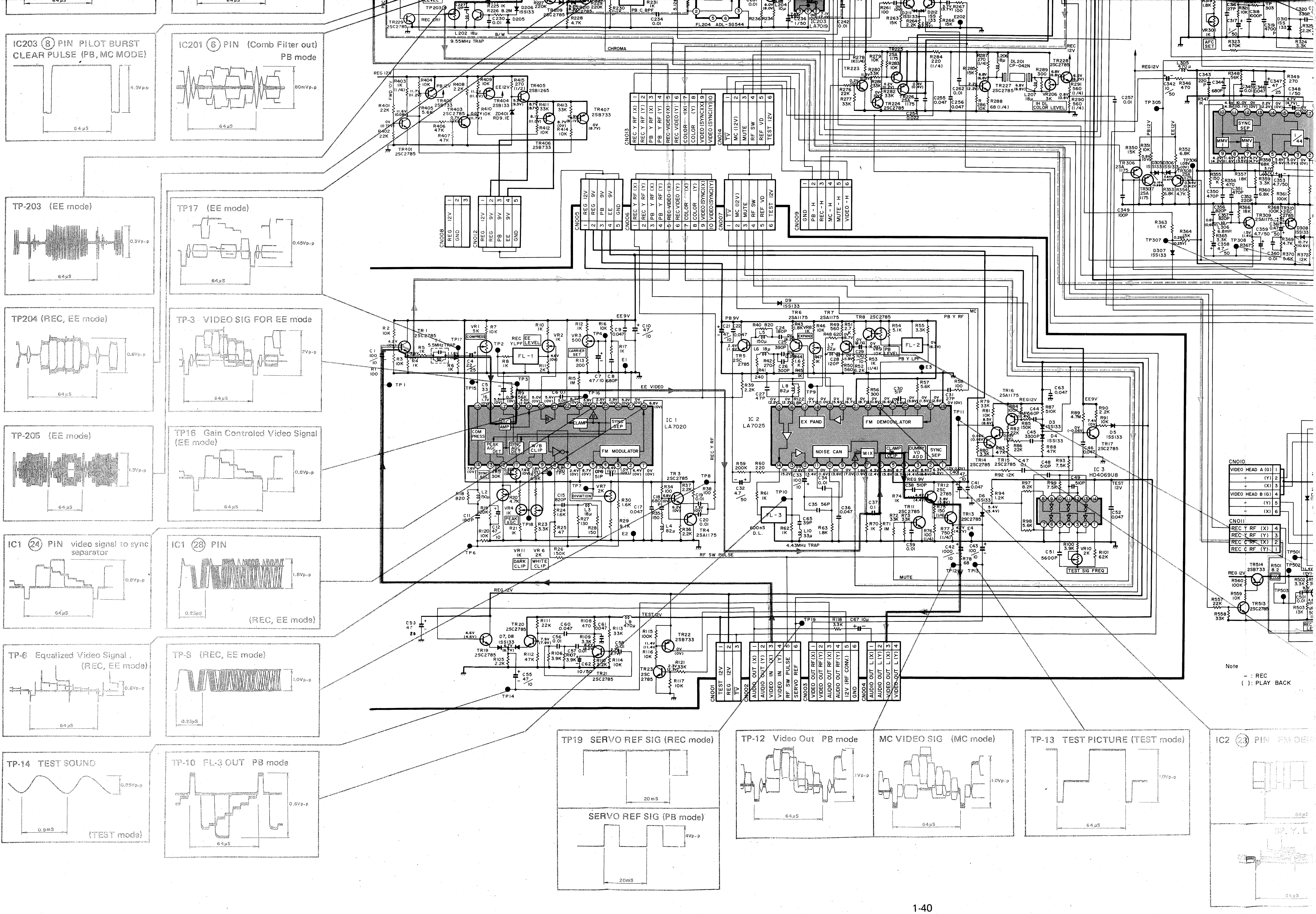

short
cathode
long
anode

Y. PROCESS (PWV-434)/CHROMA PREAMP (PWV-435) CIRCUITS

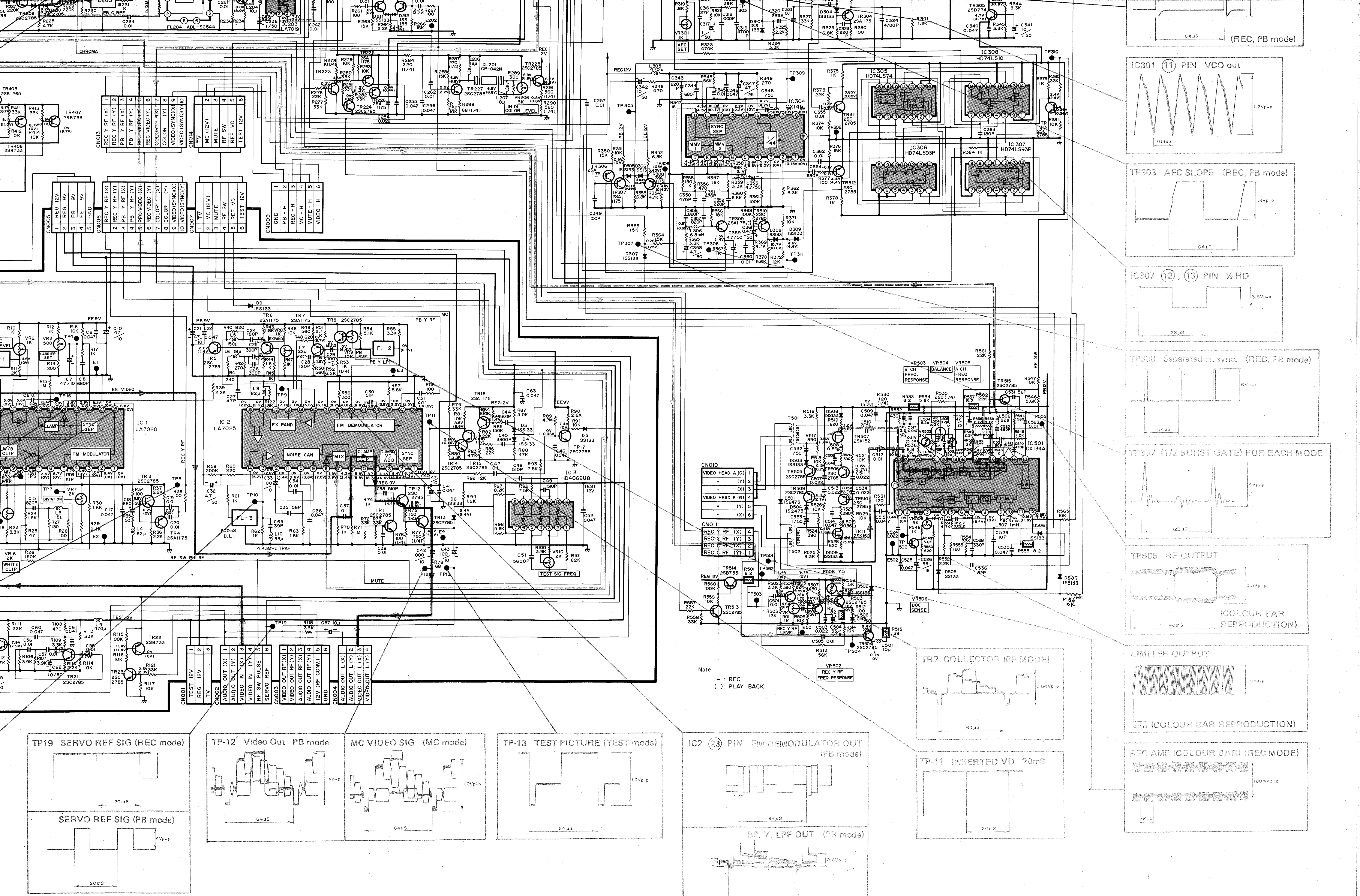
00 ...... REC MODE
(00) ...... PB MODE
REC CHROMA
PB CHROMA
REC Y
PB Y
EE SIG
PB COMPOSITE


IC201 ⑳ PIN (PB mode)
(EE, REC mode)
IC201 ㉒ PIN BURST GATE PULSE
(EE, REC, PB mode)
IC201 ㉔ PIN Chroma Converter Carrier
(REC, PB, MC, EE mode)
TP206 (EE mode)
TP208 Chroma Signal
TP207
TP201 (PLAY BACK mode)
IC201 ⑫ PIN (REC, EE MODE)
IC203 ⑤ PIN PILOT BURST CLEAR PULSE (PB, MC MODE)
IC201 ⑥ PIN (Comb Filter out) PB mode
TP-203 (EE mode)
TP17 (EE mode)
TP204 (REC, EE mode)
TP-3 VIDEO SIG FOR EE mode
TP-205 (EE mode)
TP16 Gain Controled Video Signal (EE mode)
64μS
1.95μS
2Vp-p
3Vp-p
5Vp-p
0.55Vp-p
0.45Vp-p
0.6Vp-p
60mVp-p
4.5Vp-p
0.3Vp-p
0.8Vp-p
1.5Vp-p
IC201 CX136A
ACC AMP
ACK DET
CW AMP DET
BURST GATE
FREQ. CONV.
IC202 LA7019
IC203 LA7019
IC601 LA7019
IC602 LA7019
PWB-483
SUB BURST PWB
IC205 CX150B
PHASE DET
FREQ CONV.
VXO
APC
44xBfn VCO
AFC DET
SYNC SEP
MMV 1
MMV 2
FL201
FL202
FL203
FL204 ADL-SG544
2H COMB FILTER
2H DL
DL201 CP-042N
1H DL COLOR LEVEL
CN005
CN006
CN007
CN008
CN009
CN012
CN013
CN014
CN010
VIDEO HEAD A (G)
VIDEO HEAD B (G)
IC 1 LA7020
COMPRESS
AGC AMP
PEAK AGC DET
SYNC AGC DET
W/B CLIP
CLAMP
SYNC SEP
FM MODULATOR
IC 2 LA7025
EXPAND
FM DEMODULATOR
NOISE CAN
MIX
CLAMP CLIP
DUMMY VD ADD
IC 3 HD4069UB
FL-1
FL-2
EE 12V
REG 12V
EE9V
PB 9V
MC 12V
CHROMA
9.55MHz TRAP
5.5MHz TRAP

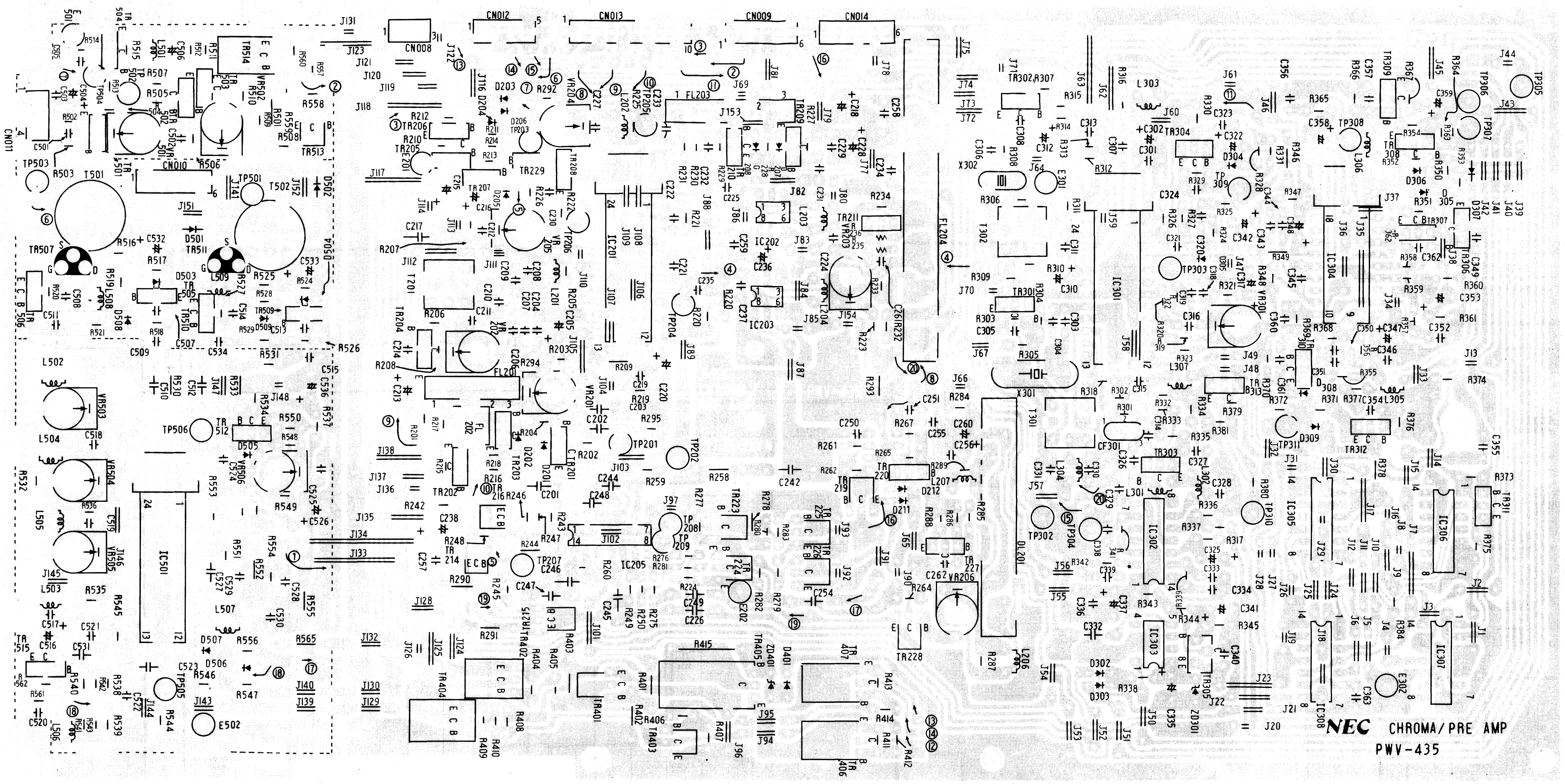

IC201 ㉒ PIN BURST GATE PULSE (EE, REC, PB mode)
5Vp-p
64μS
IC201 ㉔ PIN Chroma Converter Carrier (REC, PB, MC, EE mode)
0.55Vp-p
1.95μS
TP206 (EE mode)
0.45Vp-p
64μS
TP208 Chroma Signal
0.6Vp-p
64μS
TP207 (Chroma out)
0.5Vp-p
64μS
TP209 1H delayed Chroma (MC mode)
0.5Vp-p
64μS
2.3Vp-p
1.4μS
IC301 ⑳ PIN APC ERROR (PB MODE)
130mVp-p
20μS
IC301 ㉔ PIN BURST GATE
4Vp-p
IC301 ㉑ PIN Chroma Signal
0.25Vp-p
64μS
(EE mode)
IC301 ㉔ PIN PILOT BURST GATE PULSE
4Vp-p
IC301 ㉑ PIN Chroma
0.25Vp-p
64μS
IC301 ④ PIN AFC SAMPLE PULSE
4Vp-p
64μS
(REC, PB mode)
IC301 ⑪ PIN VCO out
1.2Vp-p
0.18μS
TP303 AFC SLOPE (REC, PB mode)
1.8Vp-p
64μS
IC307 ⑫, ⑬ PIN ½ HD
3.8Vp-p
128μS
TP308 Separated H. sync. (REC, PB mode)
6Vp-p
64μS
TP307 (1/2 BURST GATE) FOR EACH MODE
4Vp-p
IC201 CX136A
IC202 LA7019
IC203 LA7019
IC205 CX150B
IC601 LA7019
IC602 LA7019
PWB-483
SUB BURST PWB
FL203
FL204 ADL-SG544
2H COMB FILTER
DL201 CP-042N
IC301 CX832
IC302 CX150B
IC303 M58478P
IC304 CX145
IC305 HD74LS74
IC306 HD74LS93P
IC307 HD74LS93P
IC308 HD74LS10
IC 1 LA7020
IC 2 LA7025
IC 3 HD4069UB
IC 501 CX134A
FM MODULATOR
FM DEMODULATOR
EX PAND
NOISE CAN
MIX
CLAMP
SYNC SEP
DUMMY VD ADD
ACC AMP
ACK DET
CW AMP DET
BURST GATE
FREQ. CONV.
CARRIER LEAK
PILOT BURST LEVEL
COLOR LEVEL
AFC SET
FREQ CONV.
VXO
APC
BG
44xBfh VCO
AFC DET
PHASE DET
SYNC SEP
MMV 1
MMV 2
1/44
CN005
CN006
CN007
CN009
CN010
CN013
CN014
VIDEO HEAD A
VIDEO HEAD B
B CH FREQ. RESPONSE
BALANCE
A CH FREQ. RESPONSE
CHROMA
EE VIDEO
REC Y RF
PB Y RF
PB Y LPF
REG12V
EE12V
EE9V
MC12V


IC203 ⑧ PIN PILOT BURST CLEAR PULSE (PB, MC MODE)
4.5Vp-p
64μS
IC201 ⑥ PIN (Comb Filter out) PB mode
80mVp-p
64μS
TP-203 (EE mode)
0.3Vp-p
64μS
TP17 (EE mode)
0.45Vp-p
64μS
TP204 (REC, EE mode)
0.6Vp-p
64μS
TP-3 VIDEO SIG FOR EE mode
2Vp-p
64μS
TP-205 (EE mode)
1.5Vp-p
64μS
TP16 Gain Controled Video Signal (EE mode)
0.8Vp-p
64μS
IC1 ㉔ PIN video signal to sync separator
0.8Vp-p
64μS
IC1 ㉘ PIN
1.8Vp-p
0.23μS
(REC, EE mode)
TP-6 Equalized Video Signal (REC, EE mode)
0.6Vp-p
64μS
TP-8 (REC, EE mode)
1.0Vp-p
0.23μS
TP-14 TEST SOUND
0.85Vp-p
0.9mS
(TEST mode)
TP-10 FL-3 OUT PB mode
0.6Vp-p
64μS
TP19 SERVO REF SIG (REC mode)
20mS
SERVO REF SIG (PB mode)
4Vp-p
20mS
TP-12 Video Out PB mode
1Vp-p
64μS
MC VIDEO SIG (MC mode)
1.0Vp-p
64μS
TP-13 TEST PICTURE (TEST mode)
1.0Vp-p
64μS
IC2 ㉓ PIN FM DE
IC 1 LA7020
IC 2 LA7025
IC 3 HD4069UB
COM PRESS
AGC AMP
PEAK AGC DET
SYNC AGC DET
W/B CLIP
CLAMP
SYNC SEP
FM MODULATOR
EX PAND
FM DEMODULATOR
NOISE CAN
MIX
CLAMP CLIP
DUMMY VD ADD
SYNC SEP
MMV
MMV 2
FL-1
FL-2
FL-3
600nS D.L.
4.43MHz TRAP
5.5MHz TRAP
9.55MHz TRAP
FL204 ADL-SG544
DL201 CP-042N
PB C BPF
CHROMA
EE VIDEO
REC Y RF
RF SW PULSE
MUTE
PB Y RF
PB Y LPF
TEST SIG FREQ
DARK CLIP
WHITE CLIP
PEAK AGC
SYNC AGC
CARRIER SET
DIVIATION
REC YLPF
EE LEVEL
IH DL COLOR LEVEL
AFC SET
CN008: 1 REG 12V, 2 GND
CN012: 1 12V, 2 REG, 3 9V, 4 PB, 5 9V, 6 EE, 7 GND
CN013: 1 REC Y RF (X), 2 REC Y RF (Y), 3 PB Y RF (X), 4 PB Y RF (Y), 5 REC VIDEO (X), 6 REC VIDEO (Y), 7 COLOR (X), 8 COLOR (Y), 9 VIDEO (SYNC)(X), 10 VIDEO (SYNC)(Y)
CN014: 1 MC (12V), 2 TV, 3 MUTE, 4 RF SW, 5 REF VD, 6 TEST 12V
CN005: 1 REG 12V, 2 REG 9V, 3 9V, 4 EE, 5 9V, 6 GND
CN006: 1 REC Y RF (X), 2 REC Y RF (Y), 3 PB Y RF (X), 4 PB Y RF (Y), 5 REC VIDEO (X), 6 REC VIDEO (Y), 7 COLOR (X), 8 COLOR (Y), 9 VIDEO (SYNC)(X), 10 VIDEO (SYNC)(Y)
CN007: 1 TV, 2 MC (12V), 3 MUTE, 4 RF SW, 5 REF VD, 6 TEST 12V
CN009: 1 GND, 2 PB - H, 3 REC - H, 4 MC - H, 5 MUTE - H, 6 VIDEO - H
CN001: 1 TEST 12V, 2 REG 12V, 3 TV
CN002: 1 AUDIO OUT (X), 2 AUDIO OUT (X), 3 VIDEO IN (X), 4 VIDEO IN (Y), 5 RF SW PULSE, 6 SERVO REF
CN003: 1 VIDEO OUT RF (X), 2 VIDEO OUT RF (Y), 3 VIDEO OUT RF (X), 4 VIDEO OUT RF (Y), 5 12V (RF CONV.), 6 GND
CN004: 1 AUDIO OUT L (X), 2 AUDIO OUT L (Y), 3 VIDEO OUT L (X), 4 VIDEO OUT L (Y)
CN010: VIDEO HEAD A (G) 1, (Y) 2, (X) 3, VIDEO HEAD B (G) 4, (Y) 5, (X) 6
CN011: REC Y RF (X) 4, REC Y RF (Y) 3, REC C RF (X) 2, REC C RF (Y) 1
TP1
TP2
TP3
TP4
TP5
TP6
TP7
TP8
TP9
TP10
TP11
TP12
TP13
TP14
TP15
TP16
TP17
TP18
TP19
TP203
TP305
TP306
TP307
TP501
TP502
TP503

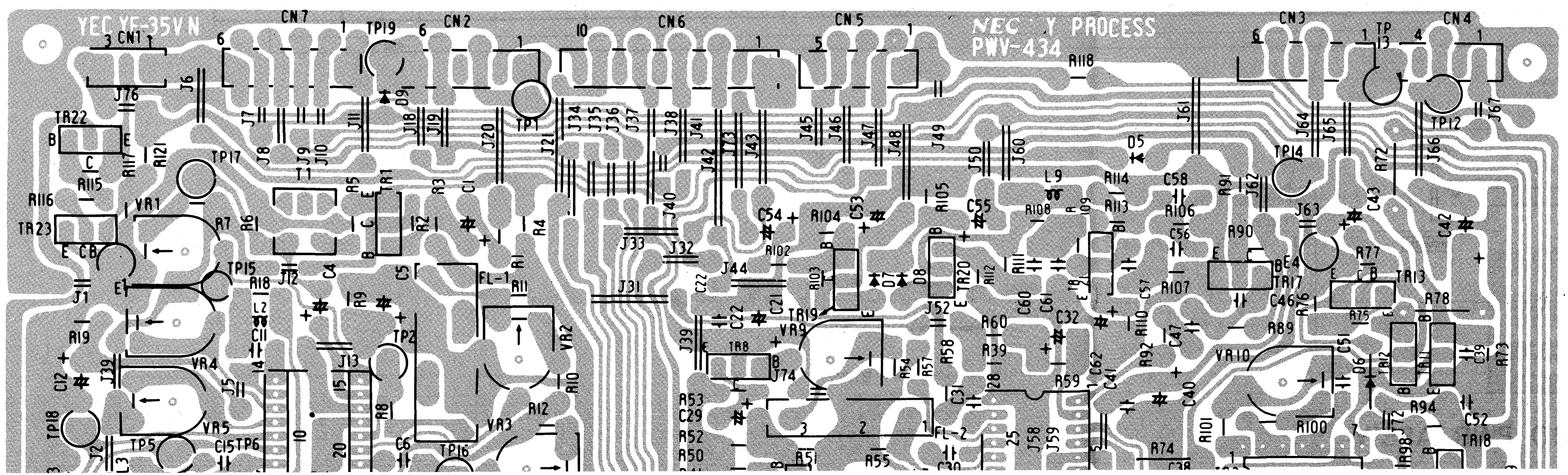
Note
- : REC
( ): PLAY BACK

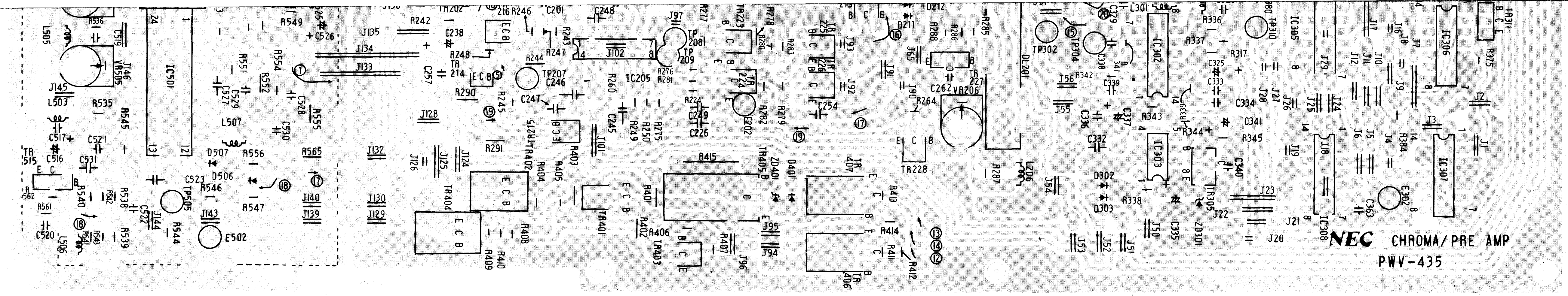

IC 1 LA7020
IC 2 LA7025
IC 3 HD4069U8
IC 304 CX145
IC 305 HD74LS74
IC 306 HD74LS93P
IC 307 HD74LS93P
IC 308 HD74LSI0
IC 501 CX134A
IC203 LA7019
FM MODULATOR
CLAMP
SYNC SEP
EX PAND
FM DEMODULATOR
NOISE CAN
MIX
DUMMY VD ADD
SYNC SEP
CLAMP CLIP
SYNC SEP
MMV
SCHMOT
DET
LIM
SW
CN001
CN002
CN004
CN005
CN006
CN007
CN009
CN010
CN011
CN013
CN014
VIDEO HEAD A
VIDEO HEAD B
REC Y RF
REC C RF
TEST 12V
REG 12V
AUDIO OUT
VIDEO IN
VIDEO OUT
RF SW PULSE
SERVO REF
MUTE
CHROMA
EE VIDEO
PB Y RF
REC Y RF
PB 9V
EE9V
REG 9V
FL-2
FL-3
FL204 ADL-SG544
600nS D.L.
4.43MHz TRAP
PB LEVEL
PB Y LPF
CARRIER SET
DIVIATION
WHITE CLIP
W/B CLIP
TEST SIG FREQ
AFC SET
B CH FREQ. RESPONSE
BALANCE
A CH FREQ. RESPONSE
REC Y RF LEVEL
VR502 REC Y RF FREQ RESPONSE
VR506 DOC SENSE
IH DL COLOR LEVEL
Note
— : REC
( ) : PLAY BACK
(REC, PB mode)
IC301 ⑪ PIN VCO out
1.2Vp-p
0.18μS
TP303 AFC SLOPE (REC, PB mode)
1.8Vp-p
64μS
IC307 ⑫, ⑬ PIN ½ HD
3.8Vp-p
128μS
TP306 Separated H. sync. (REC, PB mode)
6Vp-p
64μS
TP307 (1/2 BURST GATE) FOR EACH MODE
4Vp-p
128μS
TP505 RF OUTPUT
0.5Vp-p
40mS
(COLOUR BAR REPRODUCTION)
LIMITER OUTPUT
1.4Vp-p
0.2μS (COLOUR BAR REPRODUCTION)
REC AMP (COLOUR BAR) (REC MODE)
180mVp-p
64μS
TR7 COLLECTOR (PB MODE)
0.64Vp-p
64μS
TP-11 INSERTED VD 20mS
20mS
IC2 ㉓ PIN FM DEMODULATOR OUT (PB mode)
64μS
BP. Y. LPF OUT (PB mode)
0.5Vp-p
64μS
TP-13 TEST PICTURE (TEST mode)
1.0Vp-p
64μS
MC VIDEO SIG (MC mode)
1.0Vp-p
64μS
TP-12 Video Out PB mode
1Vp-p
64μS
TP19 SERVO REF SIG (REC mode)
20mS
SERVO REF SIG (PB mode)
4Vp-p
20mS

CHROMA PREAMP PWB ASS'Y

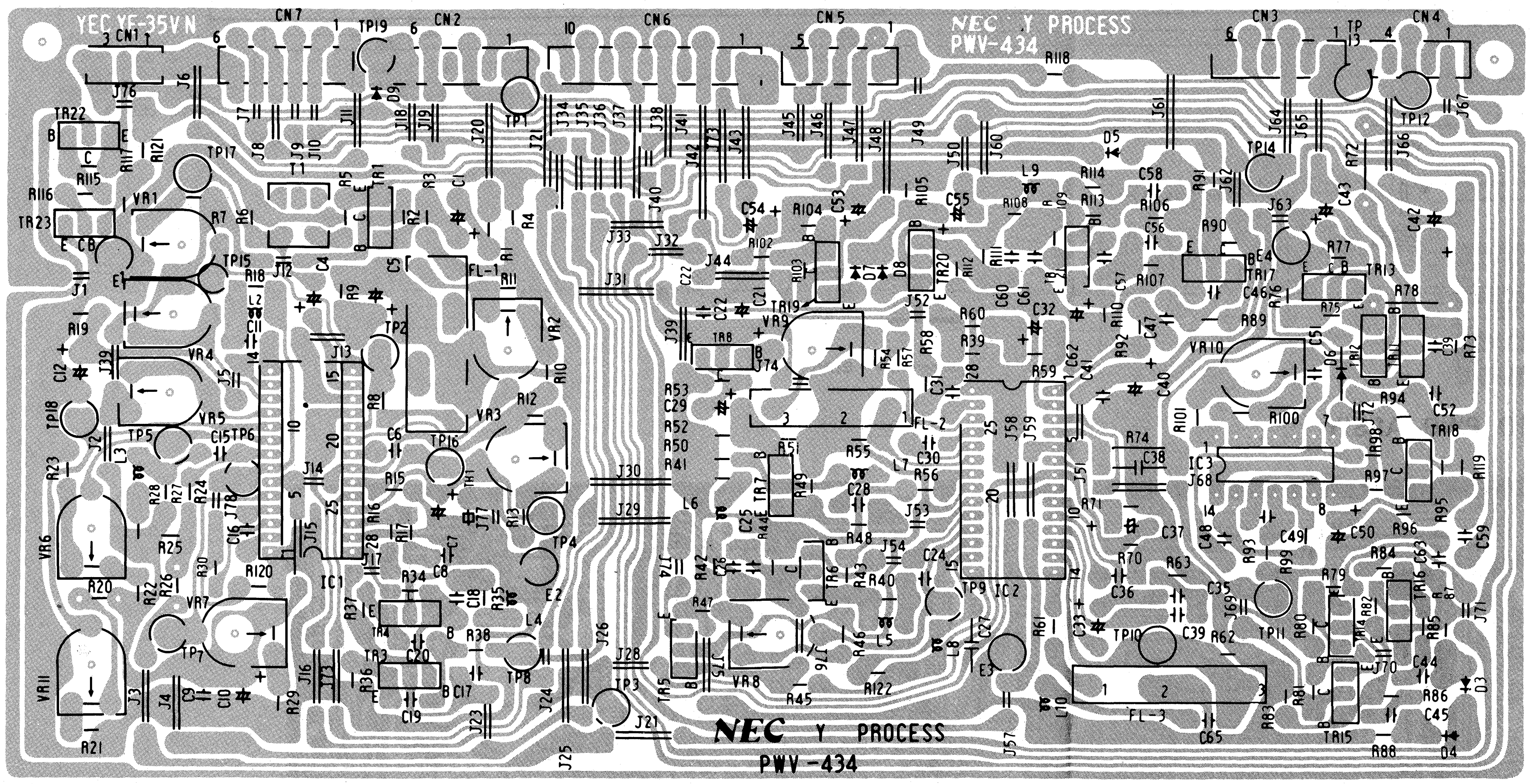

NEC CHROMA/PRE AMP
PWV-435

Y. PROCESS

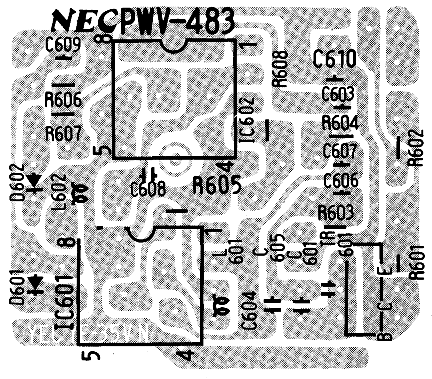

YEC YF-35VN
NEC Y PROCESS
PWV-434


NEC CHROMA/PRE AMP
PWV-435

Y. PROCESS


YEC YE-35VN
NEC Y PROCESS
PWV-434
NEC Y PROCESS
PWV-434

SUB-BURST PWB ASS'Y


NECPWV-483
YEC YE-35VN

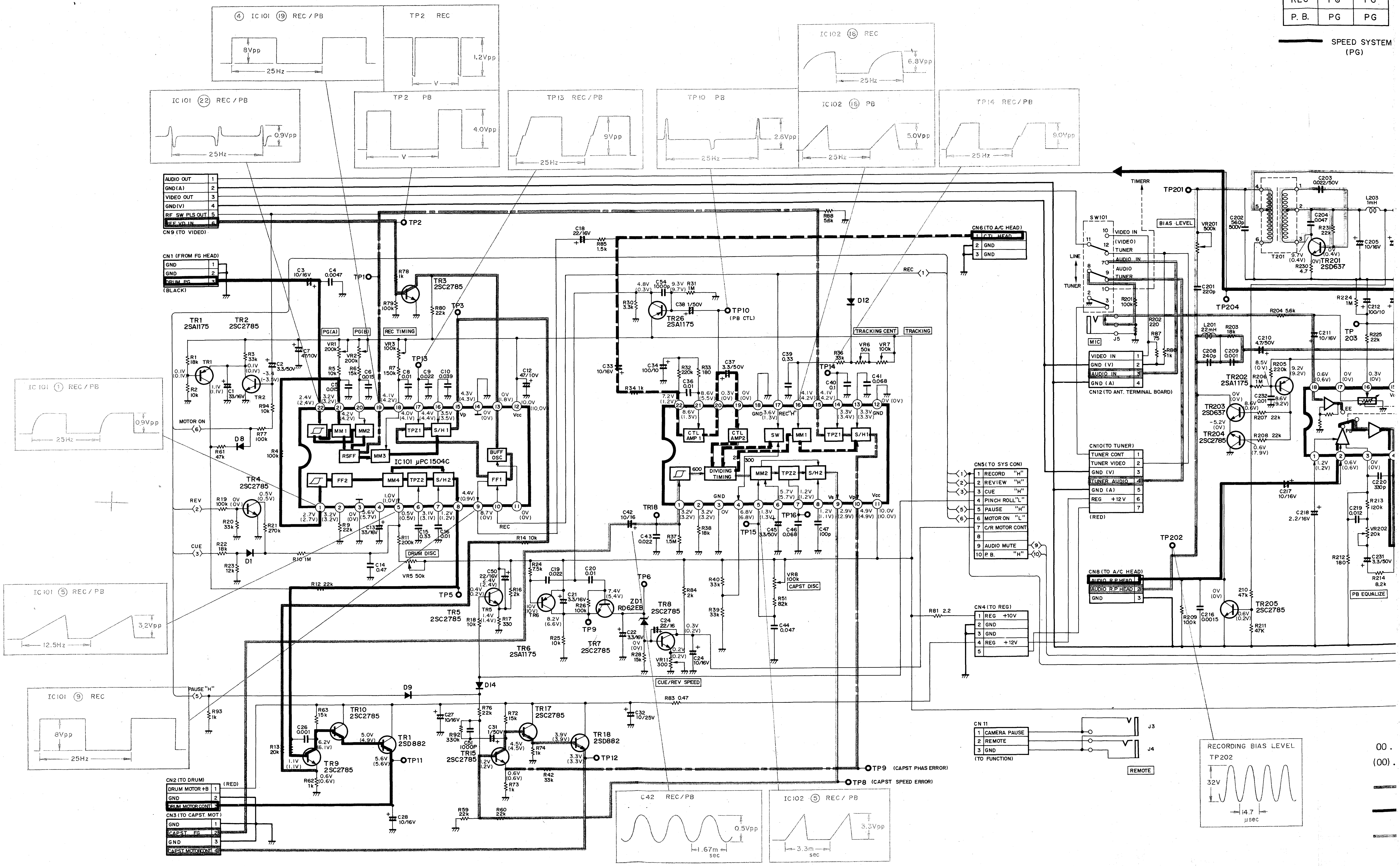
SERVO/AUDIO (PWV-421) CIRCUITS

DRUM SERVO CC

SPEED SERVO

	REFERENCE SIGNAL	COMPARISON SIGNAL
REC	PG	PG
P. B.	PG	PG

SPEED SYSTEM (PG)



④ IC101 ⑲ REC / PB 8Vpp 25Hz
TP2 REC 1.2Vpp
TP2 PB 4.0Vpp
IC101 ㉒ REC / PB 0.9Vpp 25Hz
TP13 REC / PB 9Vpp 25Hz
TP10 PB 2.6Vpp 25Hz
IC102 ⑯ REC 6.8Vpp 25Hz
IC102 ⑯ PB 5.0Vpp 25Hz
TP14 REC / PB 9.0Vpp 25Hz
IC101 ① REC / PB 0.9Vpp 25Hz
IC101 ⑤ REC / PB 3.2Vpp 12.5Hz
IC101 ⑨ REC 8Vpp 25Hz
C42 REC / PB 0.5Vpp 1.67m sec
IC102 ⑤ REC / PB 3.3Vpp 3.3m sec
RECORDING BIAS LEVEL TP202 32V 14.7 μsec
CN9 (TO VIDEO): AUDIO OUT, GND (A), VIDEO OUT, GND (V), RF SW PLS OUT, REF VD IN
CN1 (FROM FG HEAD): GND, GND, DRUM PG (BLACK)
IC101 μPC1504C
TR1 2SA1175
TR2 2SC2785
TR3 2SC2785
TR4 2SC2785
TR5 2SC2785
TR6 2SA1175
TR7 2SC2785
TR8 2SC2785
TR9 2SC2785
TR10 2SC2785
TR11 2SD882
TR15 2SC2785
TR17 2SC2785
TR18 2SD882
TR26 2SA1175
ZD1 RD62EB
MOTOR ON ⑥
REV ②
CUE ③
PAUSE "H" ⑤
DRUM DISC VR5 50k
CAPST DISC VR8 100k
CUE/REV SPEED VR11 300
PG(A) PG(B) REC TIMING
TRACKING CENT VR6 50k
TRACKING VR7 100k
TP1 TP2 TP3 TP5 TP6 TP9 TP10 (PB CTL) TP11 TP12 TP13 TP14 TP15 TP16 TP18
TP9 (CAPST PHAS ERROR)
TP8 (CAPST SPEED ERROR)
CN6 (TO A/C HEAD): CTL HEAD, GND, GND
CN5 (TO SYS CON): RECORD "H", REVIEW "H", CUE "H", PINCH ROLL "L", PAUSE "H", MOTOR ON "L", C/R MOTOR CONT, AUDIO MUTE, P.B. "H"
CN4 (TO REG): REG +10V, GND, GND, REG +12V
CN11 (TO FUNCTION): CAMERA PAUSE, REMOTE, GND
J3 J4 REMOTE
CN2 (TO DRUM): DRUM MOTOR +B, GND, DRUM MOTOR CONT (RED)
CN3 (TO CAPST. MOT): GND, CAPST FG, GND, CAPST MOTOR CONT
CN10 (TO TUNER): TUNER CONT, TUNER VIDEO, GND (V), TUNER AUDIO, GND (A), REG +12V (RED)
CN12 (TO ANT. TERMINAL BOARD): VIDEO IN, GND (V), AUDIO IN
CN8 (TO A/C HEAD): AUDIO R.P. HEAD, AUDIO R.P. HEAD, GND
SW101 LINE TUNER VIDEO IN (VIDEO) TUNER AUDIO IN AUDIO TUNER
MIC J5
BIAS LEVEL VR201 500k
TIMERR TP201 TP202 TP203 TP204
T201 TR201 2SD637
TR202 2SA1175
TR203 2SD637
TR204 2SC2785
TR205 2SC2785
PB EQUALIZE
CTL AMP1 CTL AMP2 SW MM1 TPZ1 S/H1 DIVIDING TIMING MM2 TPZ2 S/H2
MM1 MM2 RSFF MM3 TPZ1 S/H1 BUFF OSC FF2 MM4 TPZ2 S/H2 FF1

SERVO/AUDIO PWB ASS'Y

00 .
(00) .

DRUM SERVO COMPARISON SIGNAL

SPEED SERVO

	REFERENCE SIGNAL	COMPARISON SIGNAL
REC	PG	PG
P. B.	PG	PG

PHASE SERVO

	REFERENCE SIGNAL	COMPARISON SIGNAL
REC	VD	PG
P. B.	X.TAL VD	PG

▬ SPEED SYSTEM (PG)

▬ PHASE SYSTEM (VD. X'TAL VD)

CAPSTAN SERVO COMPARISON SIGNAL

SPEED SERVO

	REFERENCE SIGNAL	COMPARISON SIGNAL
REC	FG	FG
P. B.	FG	FG

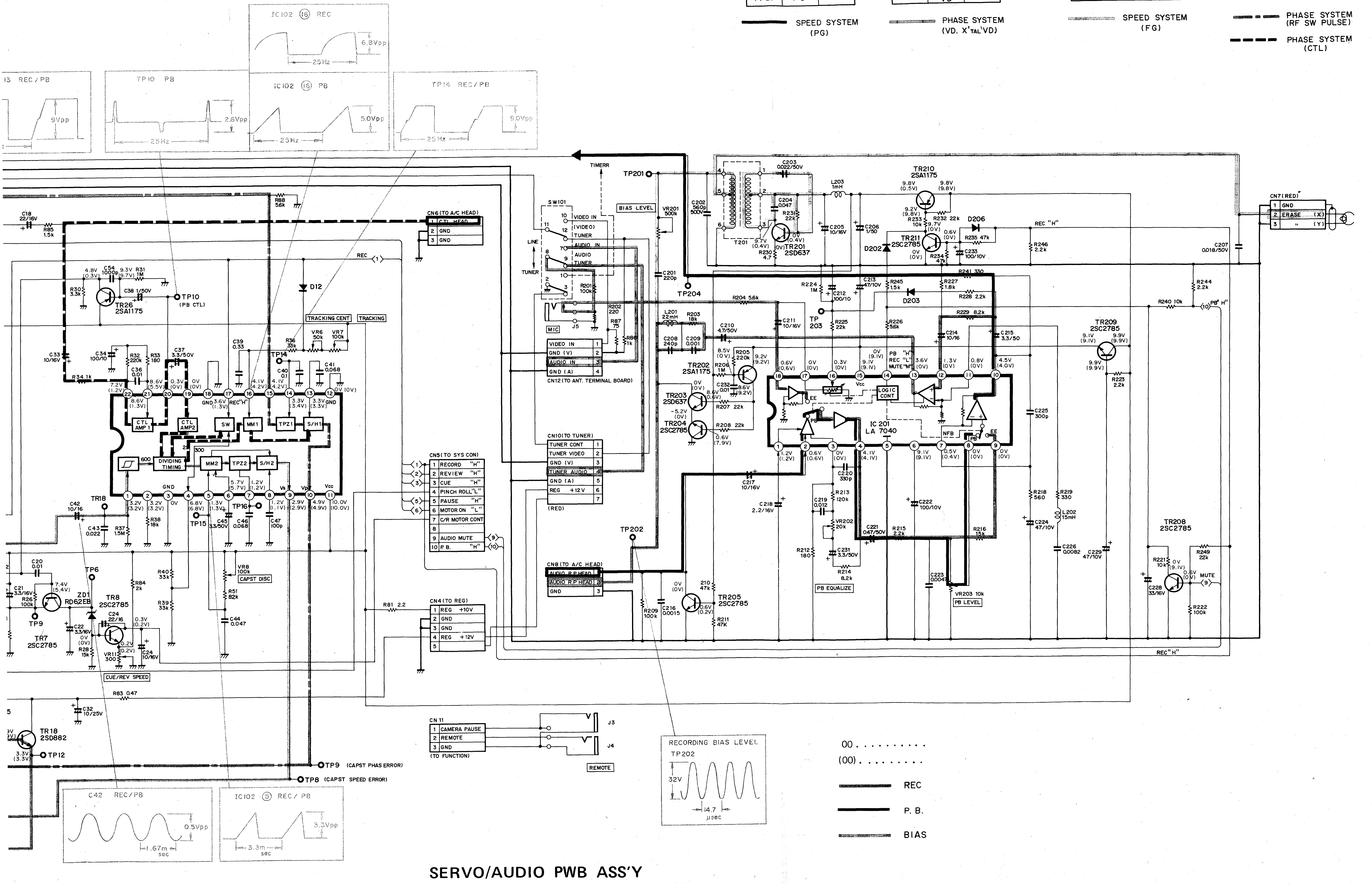
PHASE SERVO

	REFERENCE SIGNAL	COMPARISON SIGNAL
REC	RF SW PULSE	FG
P. B.	RF SW PULSE	CTL

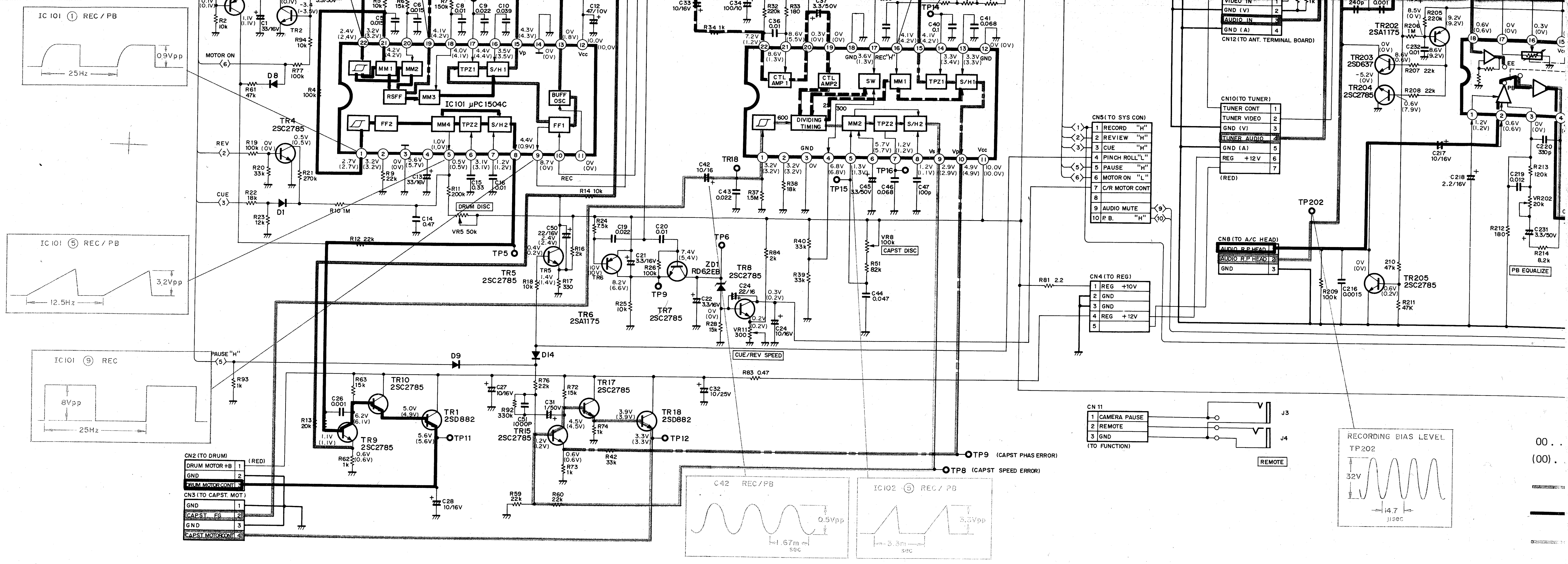
▬ SPEED SYSTEM (FG)

▬ PHASE SYSTEM (RF SW PULSE)

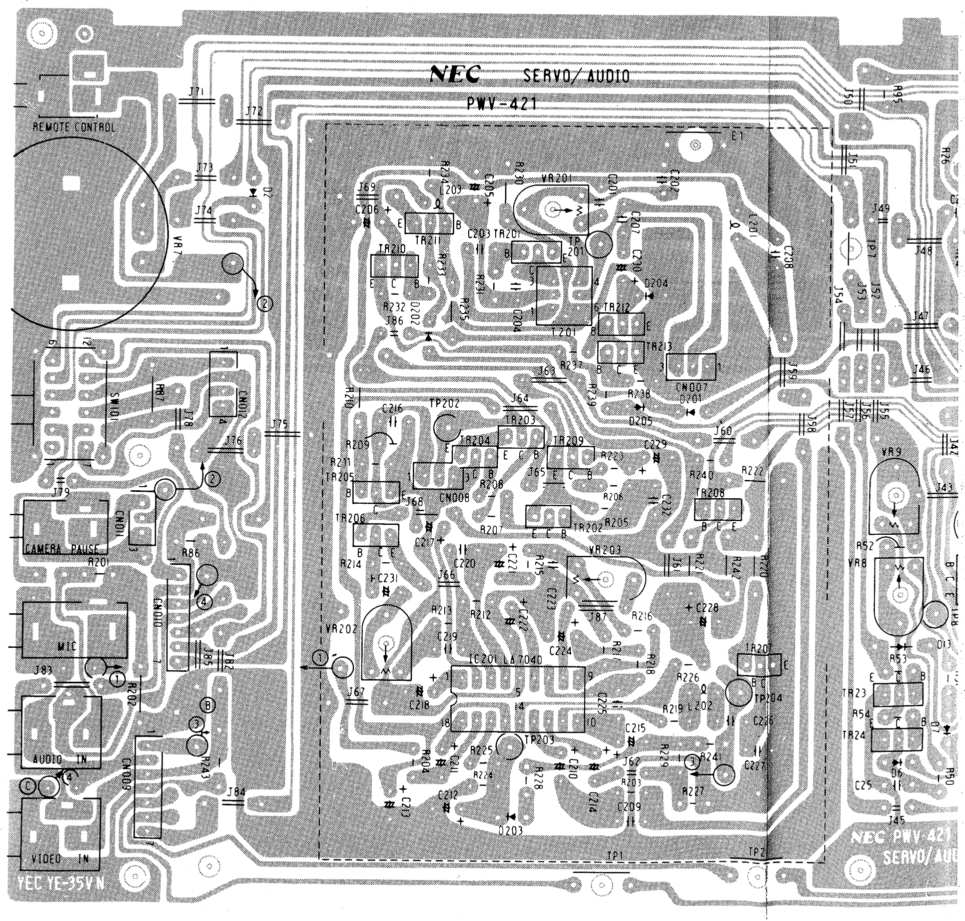
▬ PHASE SYSTEM (CTL)

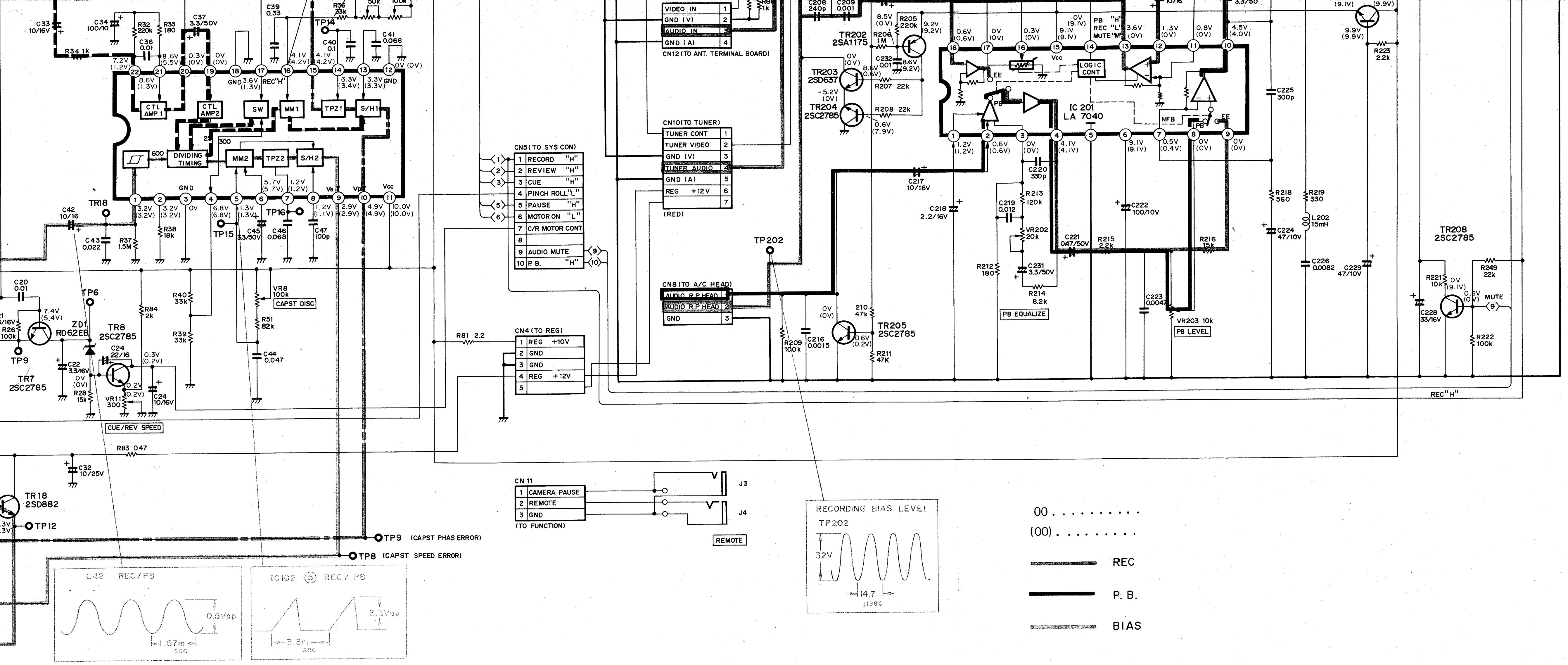

IC102 ⑯ REC
6.8Vpp
25Hz
13 REC/PB
9Vpp
TP10 PB
2.6Vpp
IC102 ⑯ PB
5.0Vpp
TP14 REC/PB
9.0Vpp
TIMERR
TP201
BIAS LEVEL
SW101
LINE
TUNER
MIC
J5
TP204
CN6 (TO A/C HEAD)
1 CTL HEAD
2 GND
3 GND
TR26 2SA1175
TP10 (PB CTL)
D12
TRACKING CENT
TRACKING
TP14
CTL AMP1
CTL AMP2
SW
MM1
TPZ1
S/H1
DIVIDING TIMING
MM2
TPZ2
S/H2
TR18
TP15
TP16
CN12 (TO ANT. TERMINAL BOARD)
VIDEO IN
GND (V)
AUDIO IN
GND (A)
CN10 (TO TUNER)
TUNER CONT
TUNER VIDEO
GND (V)
TUNER AUDIO
GND (A)
REG +12V
(RED)
CN5 (TO SYS CON)
1 RECORD "H"
2 REVIEW "H"
3 CUE "H"
4 PINCH ROLL "L"
5 PAUSE "H"
6 MOTOR ON "L"
7 C/R MOTOR CONT
8
9 AUDIO MUTE
10 P.B. "H"
CAPST DISC
TP6
ZD1 RD62EB
TR8 2SC2785
TP9
TR7 2SC2785
CUE/REV SPEED
CN4 (TO REG)
1 REG +10V
2 GND
3 GND
4 REG +12V
5
CN8 (TO A/C HEAD)
AUDIO R.P HEAD
AUDIO R.P HEAD
GND
TP202
TR18 2SD882
TP12
TP9 (CAPST PHAS ERROR)
TP8 (CAPST SPEED ERROR)
CN 11
1 CAMERA PAUSE
2 REMOTE
3 GND
(TO FUNCTION)
J3
J4
REMOTE
C42 REC/PB
0.5Vpp
1.67m sec
IC102 ⑤ REC/PB
3.3Vpp
3.3m sec
RECORDING BIAS LEVEL
TP202
32V
14.7 μsec
T201
TR210 2SA1175
TR201 2SD637
TR211 2SC2785
D202
D206
D203
REC "H"
CN7 (RED)
1 GND
2 ERASE (X)
3 " (Y)
TR202 2SA1175
TR203 2SD637
TR204 2SC2785
TP 203
IC 201 LA 7040
LOGIC CONT
NFB
PB
EE
PB EQUALIZE
PB LEVEL
TR205 2SC2785
TR209 2SC2785
TR208 2SC2785
MUTE
PB "H"
REC "H"
00 . . . .
(00) . . . .
REC
P. B.
BIAS

SERVO/AUDIO PWB ASS'Y

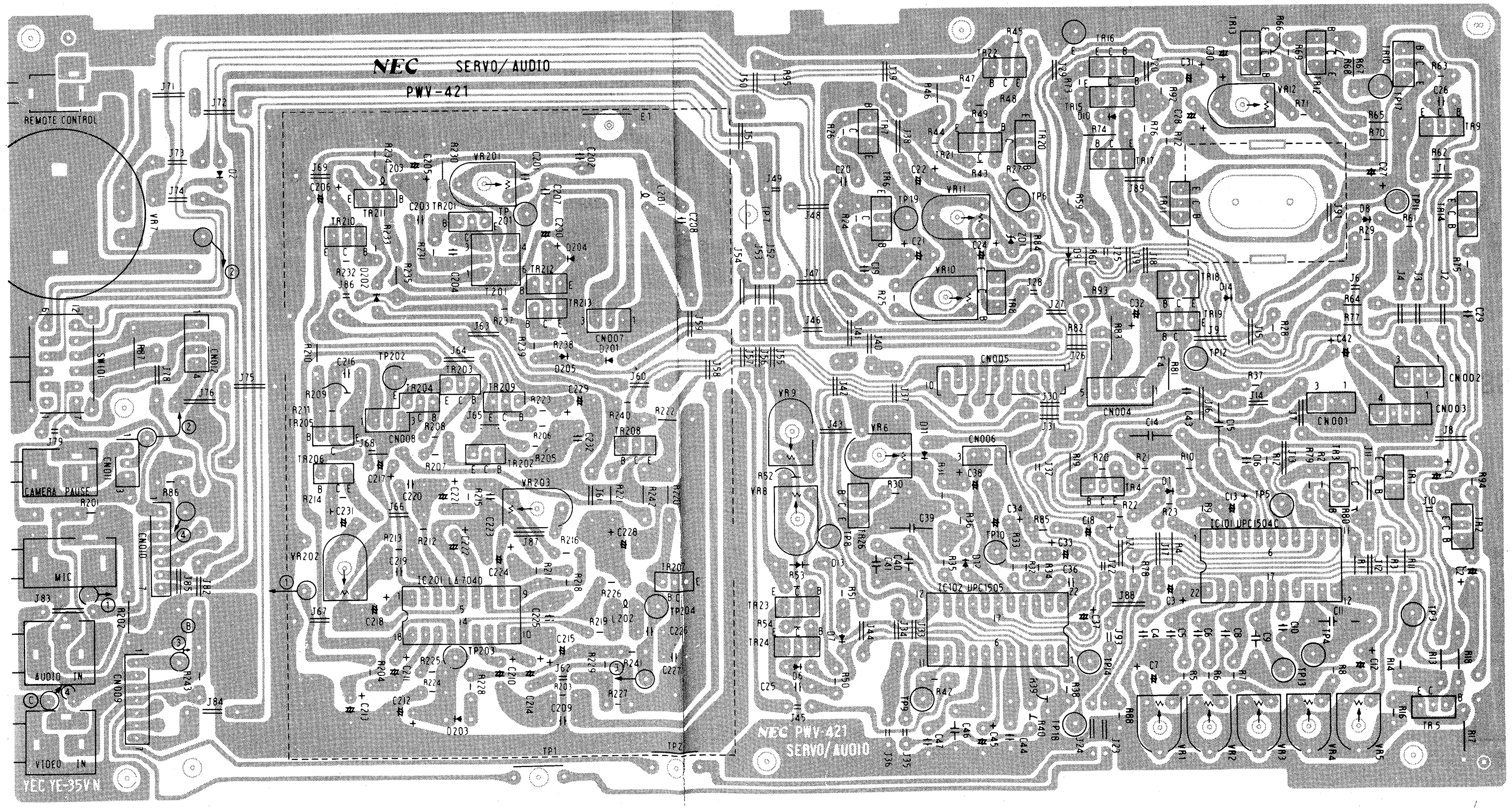

IC 101 ① REC / PB
0.9Vpp
25Hz
IC 101 ⑤ REC / PB
3.2Vpp
12.5Hz
IC101 ⑨ REC
8Vpp
25Hz
IC101 μPC1504C
MM1
MM2
RSFF
MM3
TPZ1
S/H 1
BUFF OSC
FF1
FF2
MM4
TPZ2
S/H 2
CTL AMP 1
CTL AMP2
SW
DIVIDING TIMING
MOTOR ON
REV
CUE
PAUSE "H"
DRUM DISC
VR5 50k
TR4 2SC2785
TR2
TR5 2SC2785
TR6 2SA1175
TR7 2SC2785
ZD1 RD62EB
TR8 2SC2785
TR9 2SC2785
TR10 2SC2785
TR1 2SD882
TR15 2SC2785
TR17 2SC2785
TR18 2SD882
D1
D8
D9
D14
TP5
TP6
TP7
TP9
TP11
TP12
TP14
TP15
TP16
TR18
CUE/REV SPEED
CAPST DISC
VR8 100k
VR11 300
CN2 (TO DRUM)
DRUM MOTOR +B
GND
DRUM MOTOR CONT
CN3 (TO CAPST. MOT)
GND
CAPST FG
GND
CAPST MOTOR CONT
TP9 (CAPST PHAS ERROR)
TP8 (CAPST SPEED ERROR)
C42 REC/PB
0.5Vpp
1.67m sec
IC102 ⑨ REC/PB
3.3Vpp
3.3m sec
CN5 (TO SYS CON)
1 RECORD "H"
2 REVIEW "H"
3 CUE "H"
4 PINCH ROLL "L"
5 PAUSE "H"
6 MOTOR ON "L"
7 C/R MOTOR CONT
8
9 AUDIO MUTE
10 P.B. "H"
CN4 (TO REG)
1 REG +10V
2 GND
3 GND
4 REG +12V
CN11
1 CAMERA PAUSE
2 REMOTE
3 GND
(TO FUNCTION)
J3
J4
REMOTE
CN12 (TO ANT. TERMINAL BOARD)
VIDEO IN
GND (V)
AUDIO IN
GND (A)
CN10 (TO TUNER)
TUNER CONT
TUNER VIDEO
GND (V)
TUNER AUDIO
GND (A)
REG +12V
(RED)
CN8 (TO A/C HEAD)
AUDIO R.P HEAD
AUDIO R.P HEAD
GND
TR202 2SA1175
TR203 2SD637
TR204 2SC2785
TR205 2SC2785
TP202
VR202 20k
PB EQUALIZE
RECORDING BIAS LEVEL
TP202
32V
14.7 μsec
00 . .
(00) . .

SERVO/AUDIO PWB ASS'Y

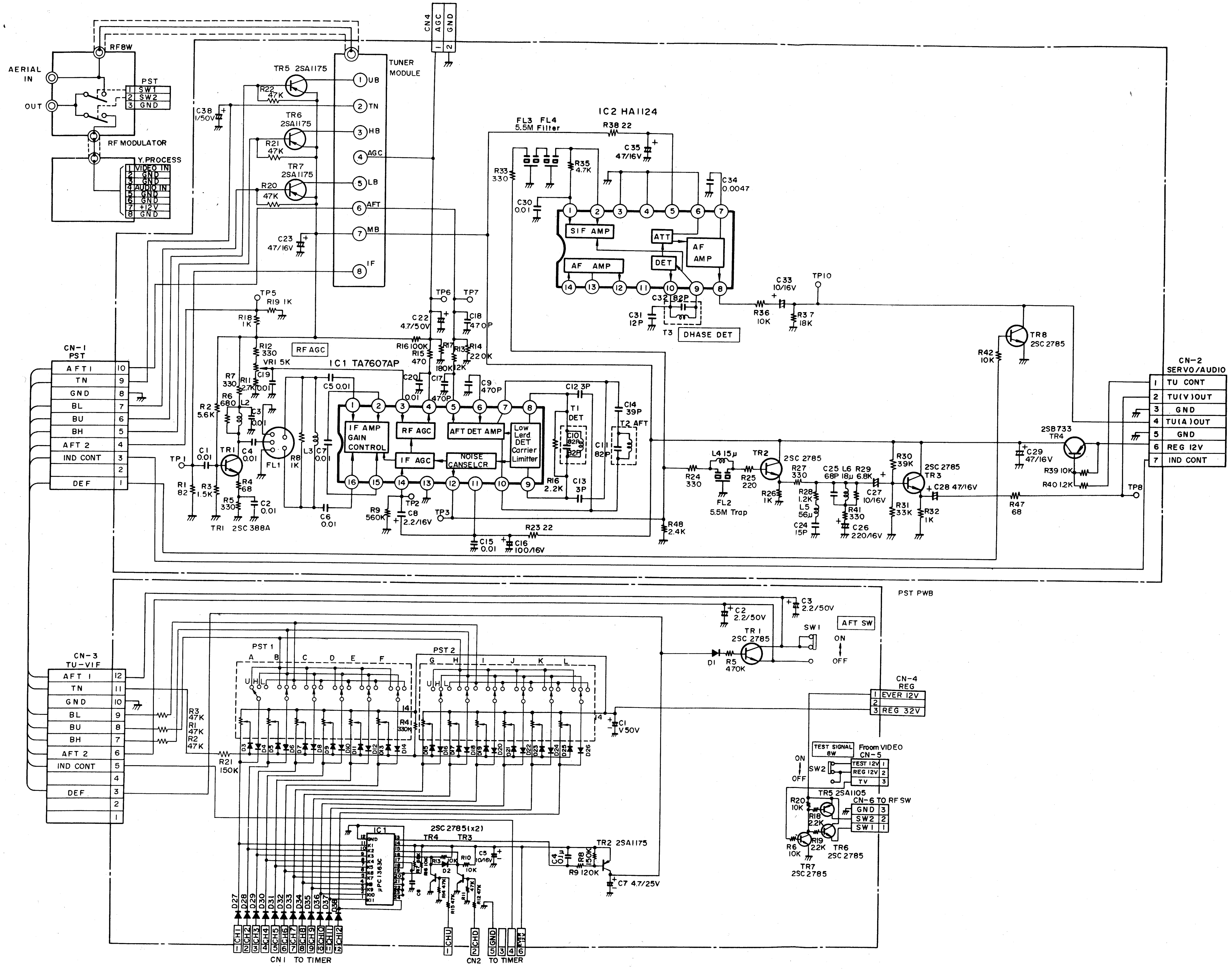

NEC SERVO/AUDIO
PWV-421
REMOTE CONTROL
CAMERA PAUSE
MIC
AUDIO IN
VIDEO IN
NEC YE-35VN
NEC PWV-421
SERVO/AUDIO
VR201
VR202
VR203
VR8
TP202
TP203
TP204
IC201


CN5 (TO SYS CON)
1 RECORD "H"
2 REVIEW "H"
3 CUE "H"
4 PINCH ROLL "L"
5 PAUSE "H"
6 MOTOR ON "L"
7 C/R MOTOR CONT
8
9 AUDIO MUTE
10 P.B. "H"
CN10 (TO TUNER)
TUNER CONT
TUNER VIDEO
GND (V)
TUNER AUDIO
GND (A)
REG +12V
(RED)
CN12 (TO ANT. TERMINAL BOARD)
VIDEO IN
GND (V)
AUDIO IN
GND (A)
CN8 (TO A/C HEAD)
AUDIO R.P HEAD
AUDIO R.P HEAD
GND
CN4 (TO REG)
1 REG +10V
2 GND
3 GND
4 REG +12V
5
CN 11
1 CAMERA PAUSE
2 REMOTE
3 GND
(TO FUNCTION)
J3
J4
REMOTE
IC 201
LA 7040
LOGIC CONT
NFB
PB EQUALIZE
PB LEVEL
VR203 10k
VR202 20k
TR202 2SA1175
TR203 2SD637
TR204 2SC2785
TR205 2SC2785
TR208 2SC2785
MUTE
REC "H"
TP202
CTL AMP 1
CTL AMP2
SW
MM1
TPZ1
S/H1
MM2
TPZ2
S/H2
DIVIDING TIMING
CAPST DISC
CUE/REV SPEED
TR18 2SD882
TR7 2SC2785
TR8 2SC2785
ZD1 RD62EB
TP9 (CAPST PHAS ERROR)
TP8 (CAPST SPEED ERROR)
C42 REC/PB
0.5Vpp
1.67m sec
IC102 ⑤ REC/PB
3.3Vpp
3.3m sec
RECORDING BIAS LEVEL
TP202
32V
14.7 μsec
00 . . . .
(00) . . . .
REC
P. B.
BIAS

SERVO/AUDIO PWB ASS'Y

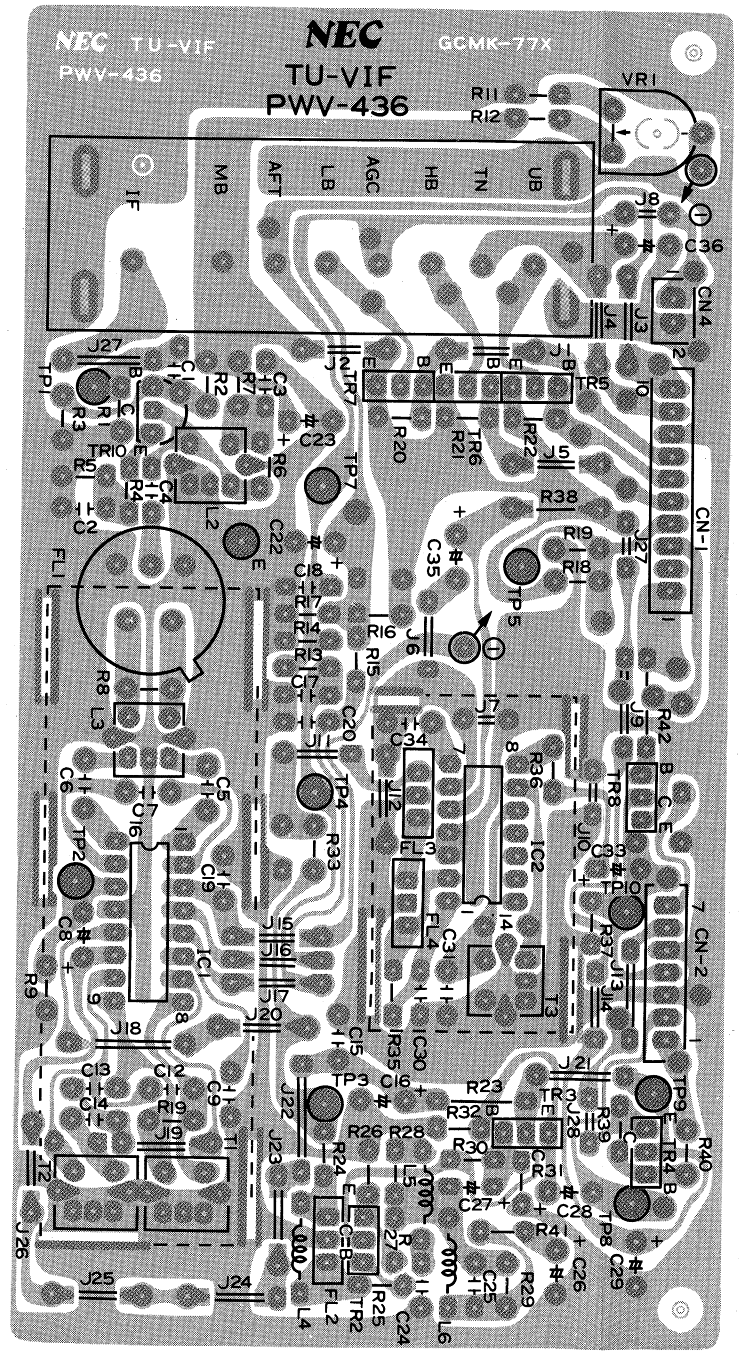

NEC SERVO/AUDIO
PWV-421
REMOTE CONTROL
CAMERA PAUSE
MIC
AUDIO IN
VIDEO IN
YEC YE-35VN
IC201 LA 7040
IC102 UPC1505
IC101 UPC1504C
NEC PWV-421 SERVO/AUDIO

TU-VIF (PWV-436)/PST (PWV-427) CIRCUITS



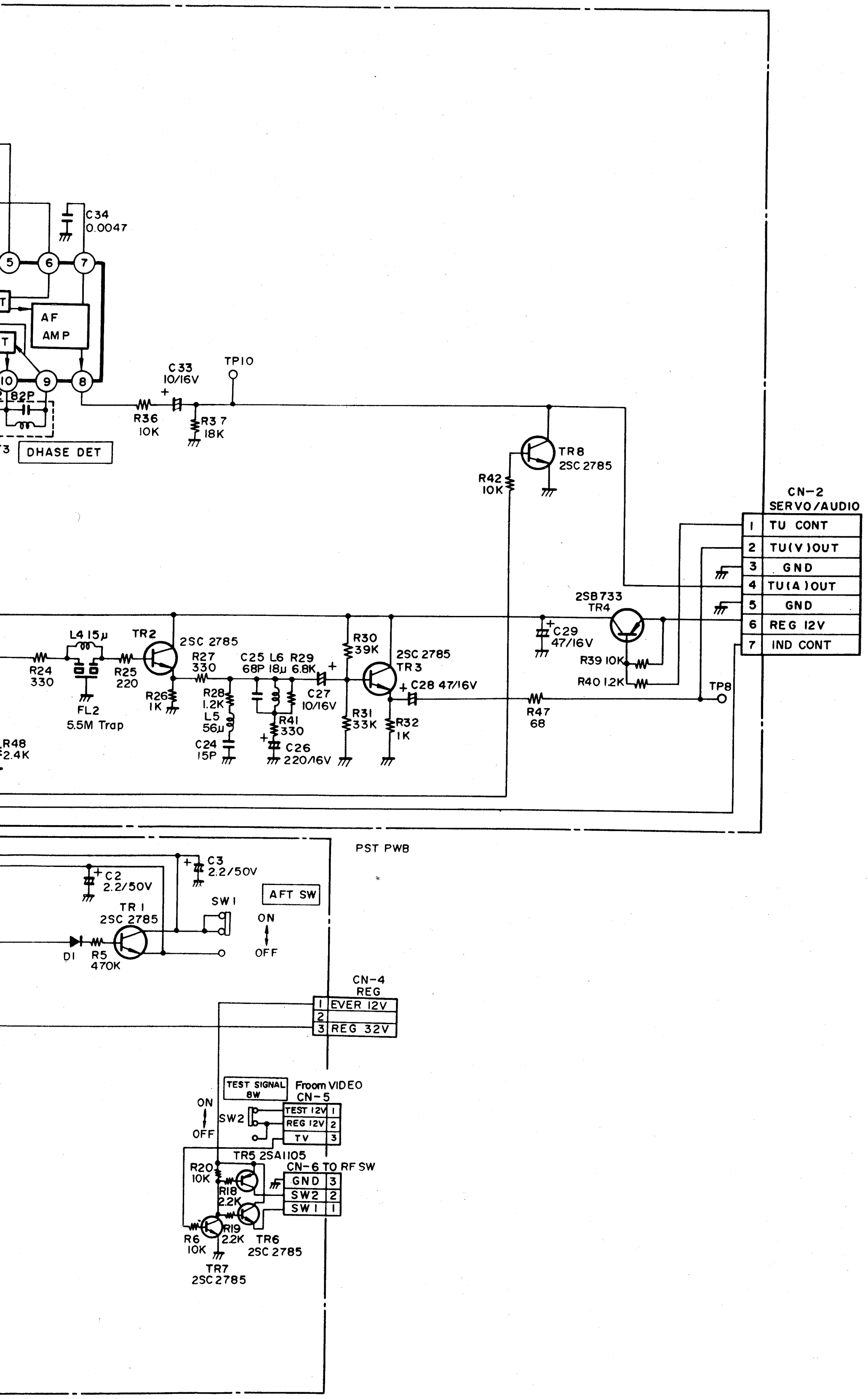
AERIAL IN
OUT
RF8W
PST
SW1
SW2
GND
RF MODULATOR
Y.PROCESS
VIDEO IN
AUDIO IN
+12V
CN4
AGC
GND
TUNER MODULE
UB
TN
HB
AGC
LB
AFT
MB
IF
TR5 2SA1175
TR6 2SA1175
TR7 2SA1175
R22 47K
R21 47K
R20 47K
C38 1/50V
C23 47/16V
FL3 FL4 5.5M Filter
IC2 HA1124
R38 22
C35 47/16V
R35 4.7K
R33 330
C30 0.01
C34 0.0047
SIF AMP
ATT
AF AMP
AF AMP
DET
C32 82P
C31 12P
T3
DHASE DET
C33 10/16V
TP10
R36 10K
R37 18K
TR8 2SC2785
R42 10K
TP5
R19 1K
R18 1K
TP6
TP7
C22 4.7/50V
C18 470P
R16 100K
R15 470
R17 180K
R13 12K
R14 220K
R12 330
RF AGC
VR1 5K
C19
IC1 TA7607AP
R11 2.7K
R7 330
R6 680
R2 5.6K
C1 0.01
TR1
C4 0.01
FL1
R8 1K
L3
C7 0.01
C5 0.01
C20 0.01
C17 470P
C9 470P
C12 3P
T1 DET
C10 82P
C14 39P
T2 AFT
C11 82P
IF AMP GAIN CONTROL
RF AGC
AFT DET AMP
Low Lerd DET Carrier Limitter
IF AGC
NOISE CANSELCR
R16 2.2K
C13 3P
TP1
R1 82
R3 1.5K
R4 68
R5 330
C2 0.01
TR1 2SC388A
C6 0.01
R9 560K
C8 2.2/16V
TP2
TP3
R23 22
C15 0.01
C16 100/16V
R48 2.4K
R24 330
L4 15μ
FL2 5.5M Trap
R25 220
TR2 2SC2785
R27 330
R26 1K
C25 68P
L6 18μ
R29 6.8K
R28 1.2K
L5 56μ
C24 15P
R41 330
C26 220/16V
C27 10/16V
R30 39K
TR3 2SC2785
C28 47/16V
R31 33K
R32 1K
2SB733 TR4
C29 47/16V
R39 10K
R40 1.2K
R47 68
TP8
CN-1 PST
AFT1
TN
GND
BL
BU
BH
AFT 2
IND CONT
DEF
CN-2 SERVO/AUDIO
TU CONT
TU(V)OUT
GND
TU(A)OUT
GND
REG 12V
IND CONT
PST PWB
C2 2.2/50V
C3 2.2/50V
AFT SW
SW1
ON
OFF
TR1 2SC2785
D1
R5 470K
CN-3 TU-VIF
AFT 1
TN
GND
BL
BU
BH
AFT 2
IND CONT
DEF
R3 47K
R1 47K
R2 47K
R21 150K
PST 1
PST 2
R41 330K
C1 V50V
CN-4 REG
EVER 12V
REG 32V
TEST SIGNAL 8W
Froom VIDEO CN-5
SW2
TEST 12V
REG 12V
TV
CN-6 TO RF SW
GND
SW2
SW1
TR5 2SA1105
R20 10K
R18 22K
R19 22K
TR6 2SC2785
R6 10K
TR7 2SC2785
IC1 μPC1363C
2SC2785(x2)
TR4 TR3
R10 10K
C5 10/16V
C4 0.1μ
R8 150K
R9 120K
TR2 2SA1175
C7 4.7/25V
CN1 TO TIMER
CN2 TO TIMER
CHU
CHD
GND

TU-VIF (PW

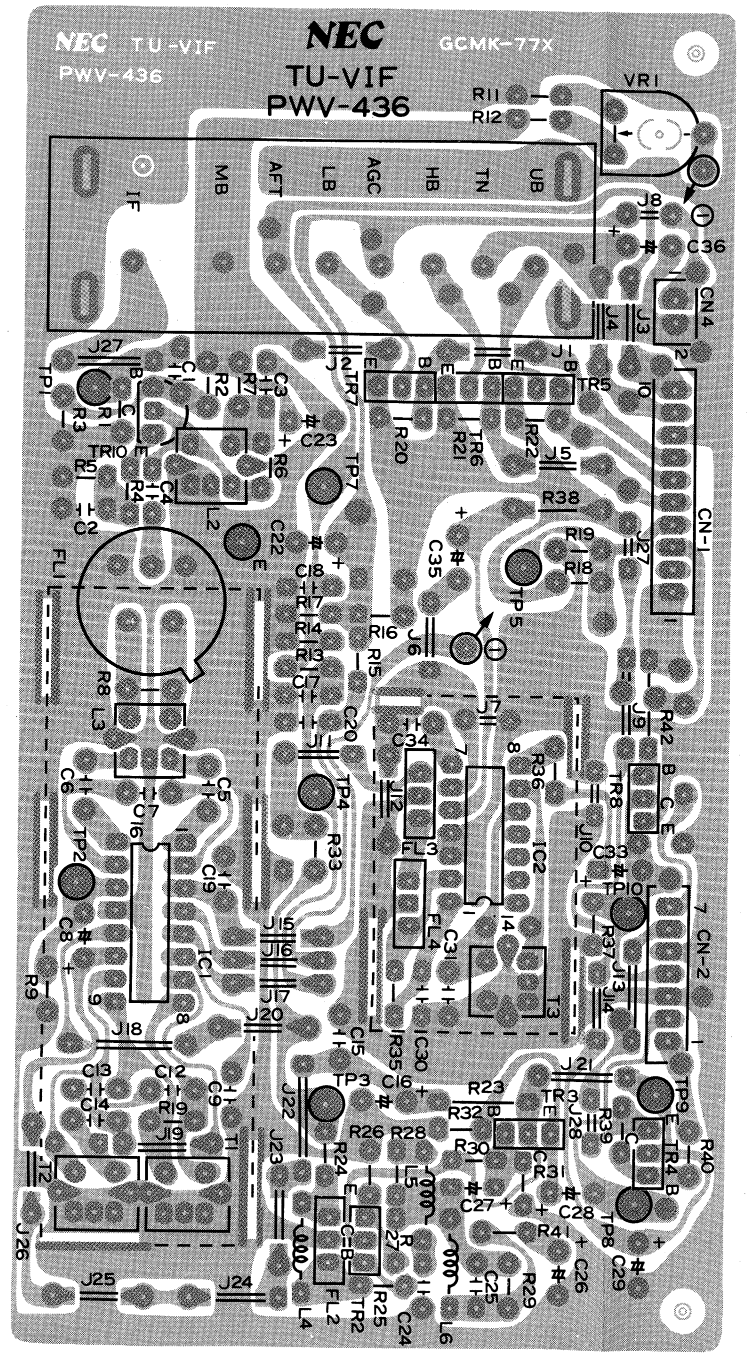


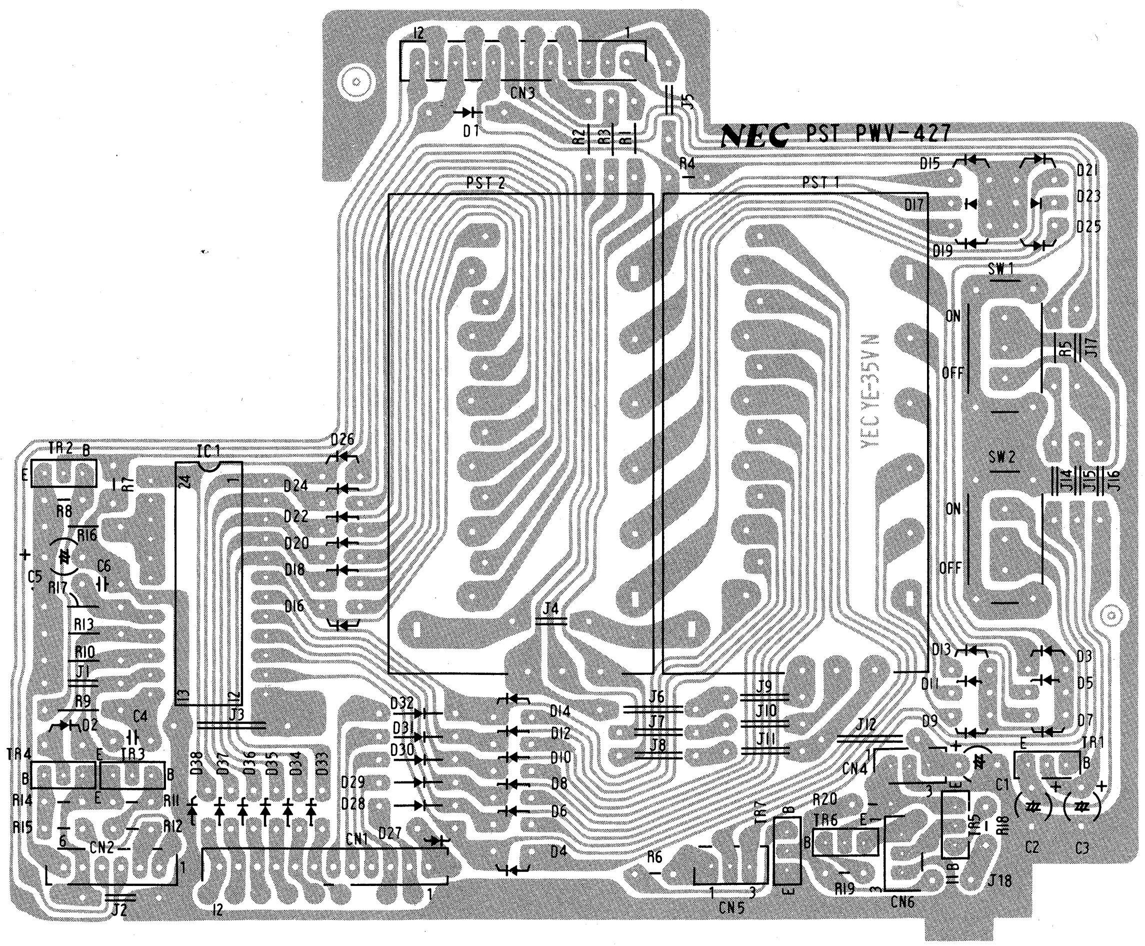
NEC TU-VIF PWV-436
NEC
TU-VIF
PWV-436
GCMK-77X
VR1
R11
R12
IF
MB
AFT
LB
AGC
HB
TN
UB
J8
C36
CN4
J27
TP1
TR10
TR5
CN-1
TP7
TP5
FL1
J6
J9
TR8
IC2
IC1
FL3
FL4
T3
CN-2
TP2
TP3
TP4
TP9
TP10
TR4
TR3
TR2
J25
J24
J26

V-427) CIRCUITS

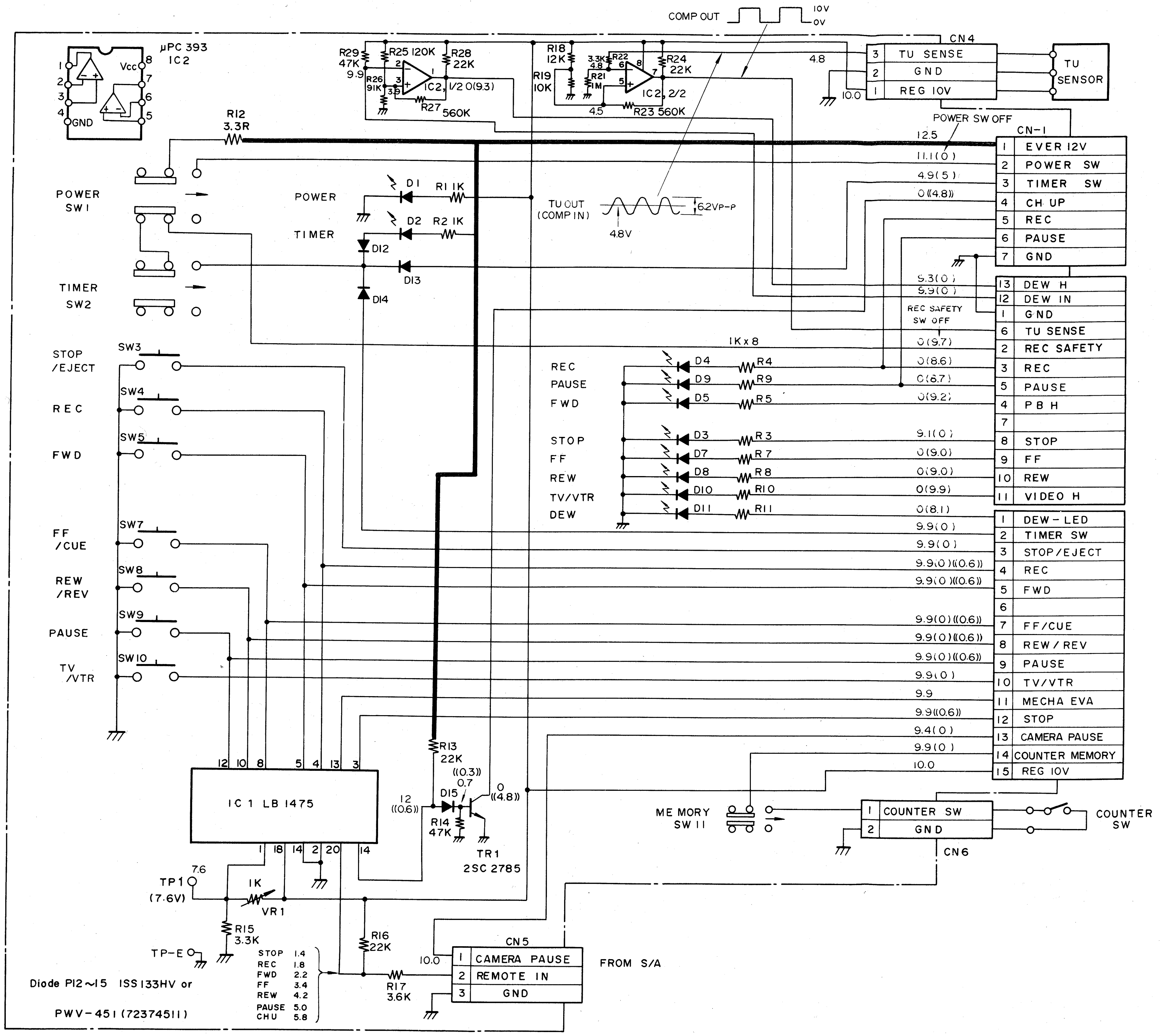

C34
0.0047
AF AMP
C33
10/16V
TP10
R36
10K
R37
18K
DHASE DET
82P
R42
10K
TR8
2SC 2785
CN-2
SERVO/AUDIO
1 TU CONT
2 TU(V)OUT
3 GND
4 TU(A)OUT
5 GND
6 REG 12V
7 IND CONT
2SB733
TR4
C29
47/16V
R39 10K
R40 1.2K
L4 15μ
TR2
2SC 2785
R24
330
R25
220
R27
330
FL2
5.5M Trap
R26
1K
C25 L6 R29
68P 18μ 6.8K
R28
1.2K
L5
56μ
C24
15P
R41
330
C26
220/16V
C27
10/16V
R30
39K
2SC 2785
TR3
C28 47/16V
R31
33K
R32
1K
R47
68
TP8
R48
2.4K
PST PWB
C2
2.2/50V
C3
2.2/50V
AFT SW
SW1
ON
OFF
TR1
2SC 2785
D1
R5
470K
CN-4
REG
1 EVER 12V
2
3 REG 32V
TEST SIGNAL
SW
Froom VIDEO
CN-5
TEST 12V 1
REG 12V 2
TV 3
ON
SW2
OFF
TR5 2SA1105
R20
10K
CN-6 TO RF SW
GND 3
SW2 2
SW1 1
R18
2.2K
R6
10K
R19
2.2K
TR6
2SC 2785
TR7
2SC 2785

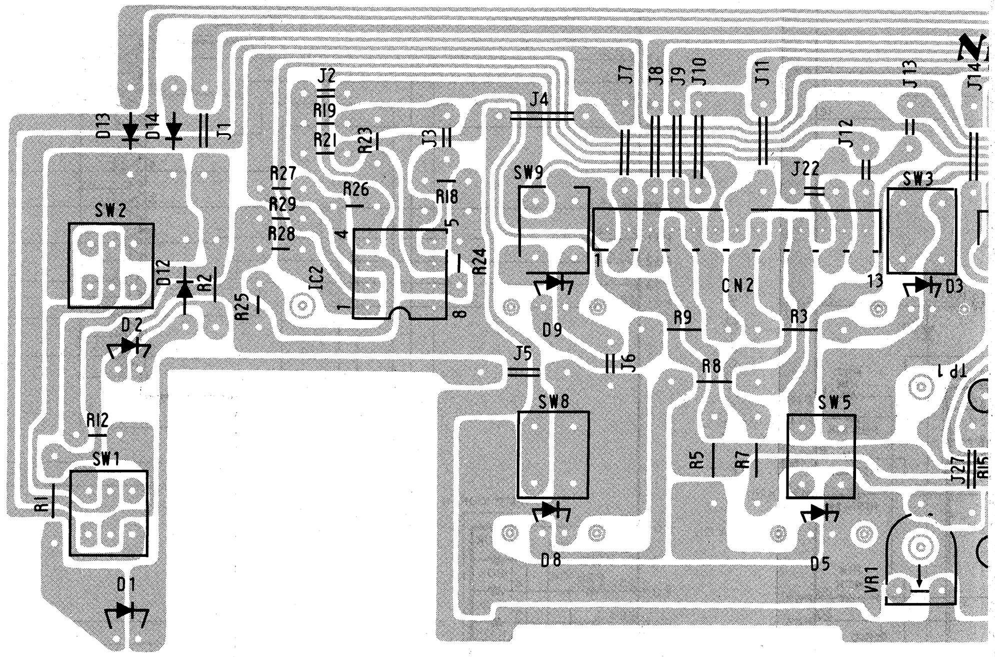
TU-VIF (PWV-436)/PST (PWV-427) PWB ASS'Y


NEC TU-VIF
PWV-436
NEC
TU-VIF
PWV-436
GCMK-77X
R11
R12
VR1
IF
MB
AFT
LB
AGC
HB
TN
UB
J8
C36
CN4
J4
J3
J27
TP1
R3
TR10
C2
C3
C23
TR7
TR5
R20
R21
TR6
R22
J5
R38
CN-1
TP7
C22
FL1
C35
R19
R18
TP5
C18
R17
R14
R13
R16
R15
C17
C20
R8
L3
C34
J7
R36
TR8
R42
C6
C7
C16
C5
TP2
J11
J12
TP4
R33
FL3
FL4
IC2
J10
C33
TP10
C19
C8
IC1
J15
J16
J17
J20
C31
T3
R37
J13
J14
CN-2
R9
J18
C13
C12
C14
R19
C9
J19
T1
IC30
R35
C15
C16
TP3
R23
TR3
J21
TP9
R32
J28
R39
TR4
J22
R26
R28
R30
R31
R40
J2
J23
R24
C27
C28
R41
TP8
J26
L5
C25
R29
C26
C29
J25
J24
FL2
TR2
R25
C24
L4
L6

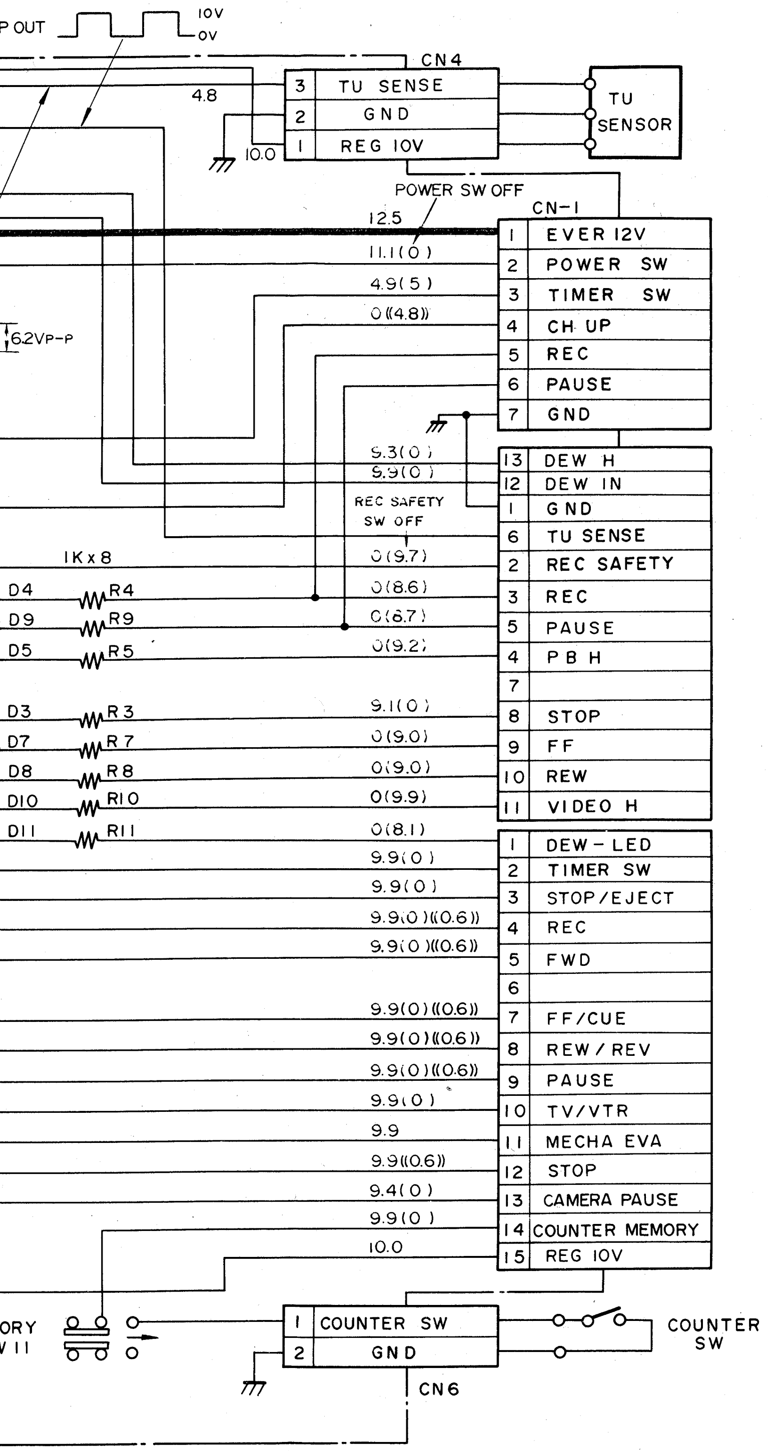

NEC PST PWV-427
J2
CN3
D1
R2
R3
R1
J5
R4
PST 2
PST 1
D15
D21
D23
D25
D17
D19
SW1
ON
OFF
R5
J17
SW2
ON
OFF
J14
J15
J16
YEC YE-35VN
TR2
R7
R8
R16
C6
C5
R17
IC1
D26
D24
D22
D20
D18
D16
R13
R10
J1
R9
C4
J4
D13
D11
D9
D3
D5
D7
TR1
J6
J7
J8
J9
J10
J11
J12
D32
D31
D30
D14
D12
D10
D8
D6
D4
TR4
TR3
R14
R15
R11
R12
D38
D37
D36
D35
D34
D33
D29
D28
D27
CN1
CN2
J2
J3
R6
TR7
TR6
R20
CN4
R19
TR5
R18
C1
C2
C3
CN5
CN6
J18

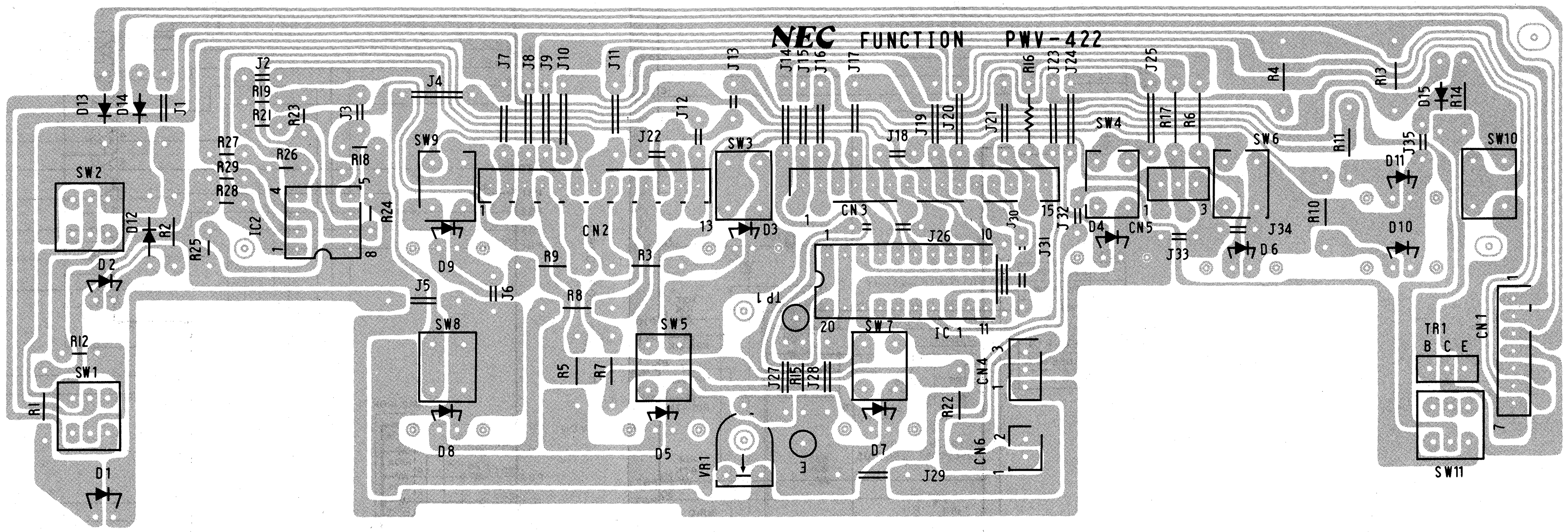
FUNCTION (PWV-422) CIRCUIT


μPC 393
IC2
Vcc
GND
COMP OUT
10V
0V
R29 47K
R25 120K
R28 22K
R26 91K
IC2, 1/2 (9.3)
R27 560K
R18 12K
R19 10K
R22 3.3K
R21 1M
R24 22K
IC2, 2/2
R23 560K
CN4
TU SENSE
GND
REG 10V
TU SENSOR
R12 3.3R
POWER SW OFF
CN-1
EVER 12V
POWER SW
TIMER SW
CH UP
REC
PAUSE
GND
POWER SW1
TIMER SW2
POWER
TIMER
D1
R1 1K
D2
R2 1K
D12
D13
D14
TU OUT (COMP IN)
6.2Vp-p
4.8V
DEW H
DEW IN
GND
TU SENSE
REC SAFETY
REC
PAUSE
PBH
STOP
FF
REW
VIDEO H
REC SAFETY SW OFF
1K x 8
D4 R4
D9 R9
D5 R5
D3 R3
D7 R7
D8 R8
D10 R10
D11 R11
REC
PAUSE
FWD
STOP
FF
REW
TV/VTR
DEW
STOP /EJECT
REC
FWD
FF /CUE
REW /REV
PAUSE
TV /VTR
SW3
SW4
SW5
SW7
SW8
SW9
SW10
DEW-LED
TIMER SW
STOP/EJECT
REC
FWD
FF/CUE
REW/REV
PAUSE
TV/VTR
MECHA EVA
STOP
CAMERA PAUSE
COUNTER MEMORY
REG 10V
IC1 LB1475
R13 22K
D15
R14 47K
TR1 2SC 2785
MEMORY SW11
COUNTER SW
GND
CN6
COUNTER SW
TP1 (7.6V)
1K
VR1
R15 3.3K
TP-E
R16 22K
R17 3.6K
STOP 1.4
REC 1.8
FWD 2.2
FF 3.4
REW 4.2
PAUSE 5.0
CHU 5.8
CN5
CAMERA PAUSE
REMOTE IN
GND
FROM S/A
Diode PI2~I5 ISS133HV or
PWV-451 (72374511)

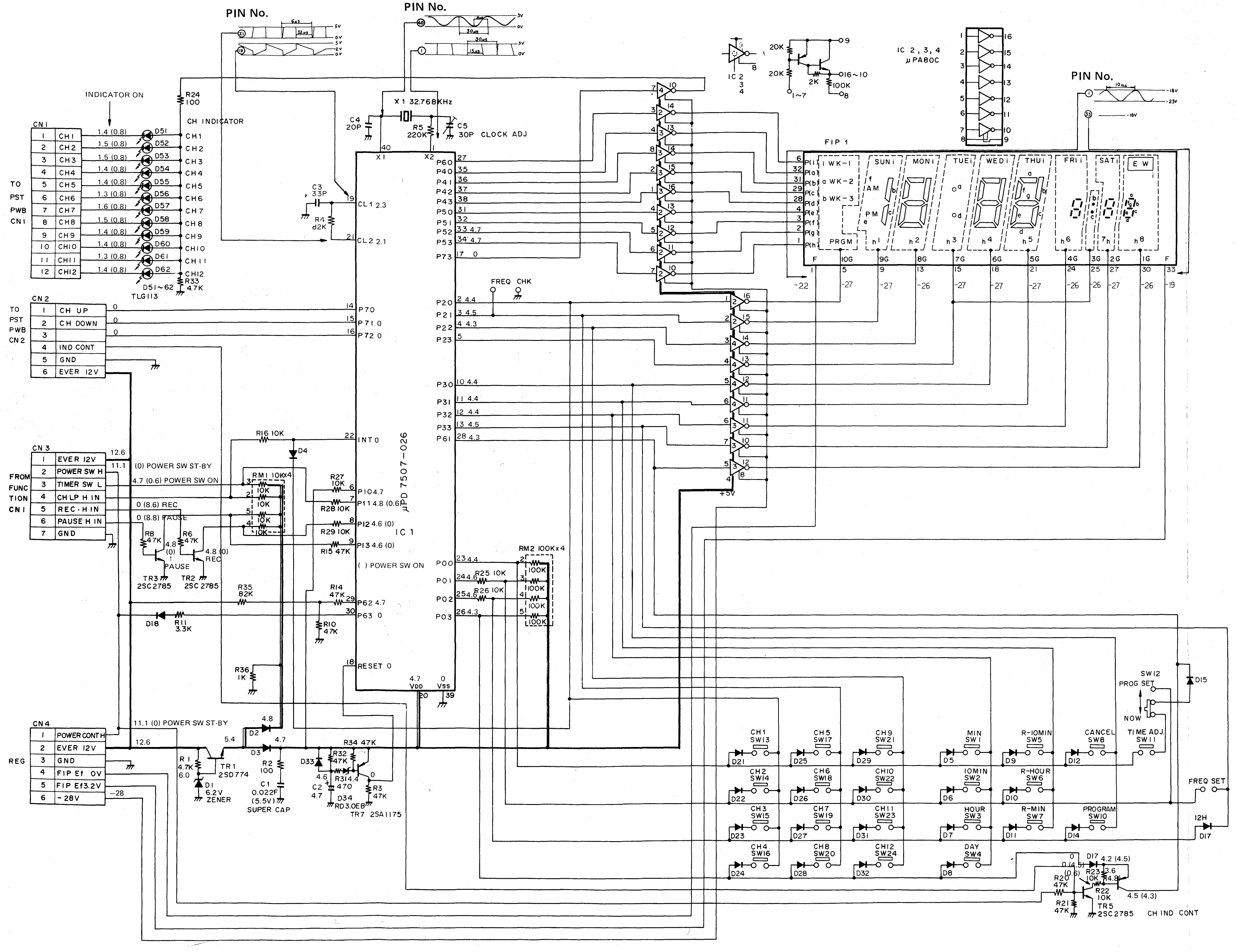

SW2
SW1
SW8
SW9
SW5
SW3
D1
D2
D3
D5
D8
D9
D12
D13
D14
J1
J2
J3
J4
J5
J6
J7
J8
J9
J10
J11
J12
J13
J14
J22
J27
R1
R2
R3
R5
R7
R8
R9
R12
R15
R18
R19
R21
R23
R25
R26
R27
R28
R29
IC2
CN2
VR1

CUIT


P OUT
10V
0V
CN4
4.8
10.0
3 TU SENSE
2 GND
1 REG 10V
TU SENSOR
POWER SW OFF
CN-1
12.5
11.1(0)
4.9(5)
0(4.8)
6.2VP-P
1 EVER 12V
2 POWER SW
3 TIMER SW
4 CH UP
5 REC
6 PAUSE
7 GND
5.3(0)
5.9(0)
REC SAFETY SW OFF
13 DEW H
12 DEW IN
1 GND
6 TU SENSE
2 REC SAFETY
3 REC
5 PAUSE
4 PBH
7
8 STOP
9 FF
10 REW
11 VIDEO H
1K x 8
D4 R4
D9 R9
D5 R5
D3 R3
D7 R7
D8 R8
D10 R10
D11 R11
0(9.7)
0(8.6)
0(6.7)
0(9.2)
9.1(0)
0(9.0)
0(9.0)
0(9.9)
0(8.1)
9.9(0)
9.9(0)
9.9(0)(0.6)
9.9(0)(0.6)
9.9(0)(0.6)
9.9(0)(0.6)
9.9(0)(0.6)
9.9(0)
9.9
9.9(0.6)
9.4(0)
9.9(0)
10.0
1 DEW-LED
2 TIMER SW
3 STOP/EJECT
4 REC
5 FWD
6
7 FF/CUE
8 REW/REV
9 PAUSE
10 TV/VTR
11 MECHA EVA
12 STOP
13 CAMERA PAUSE
14 COUNTER MEMORY
15 REG 10V
ORY
V 11
1 COUNTER SW
2 GND
COUNTER SW
CN6

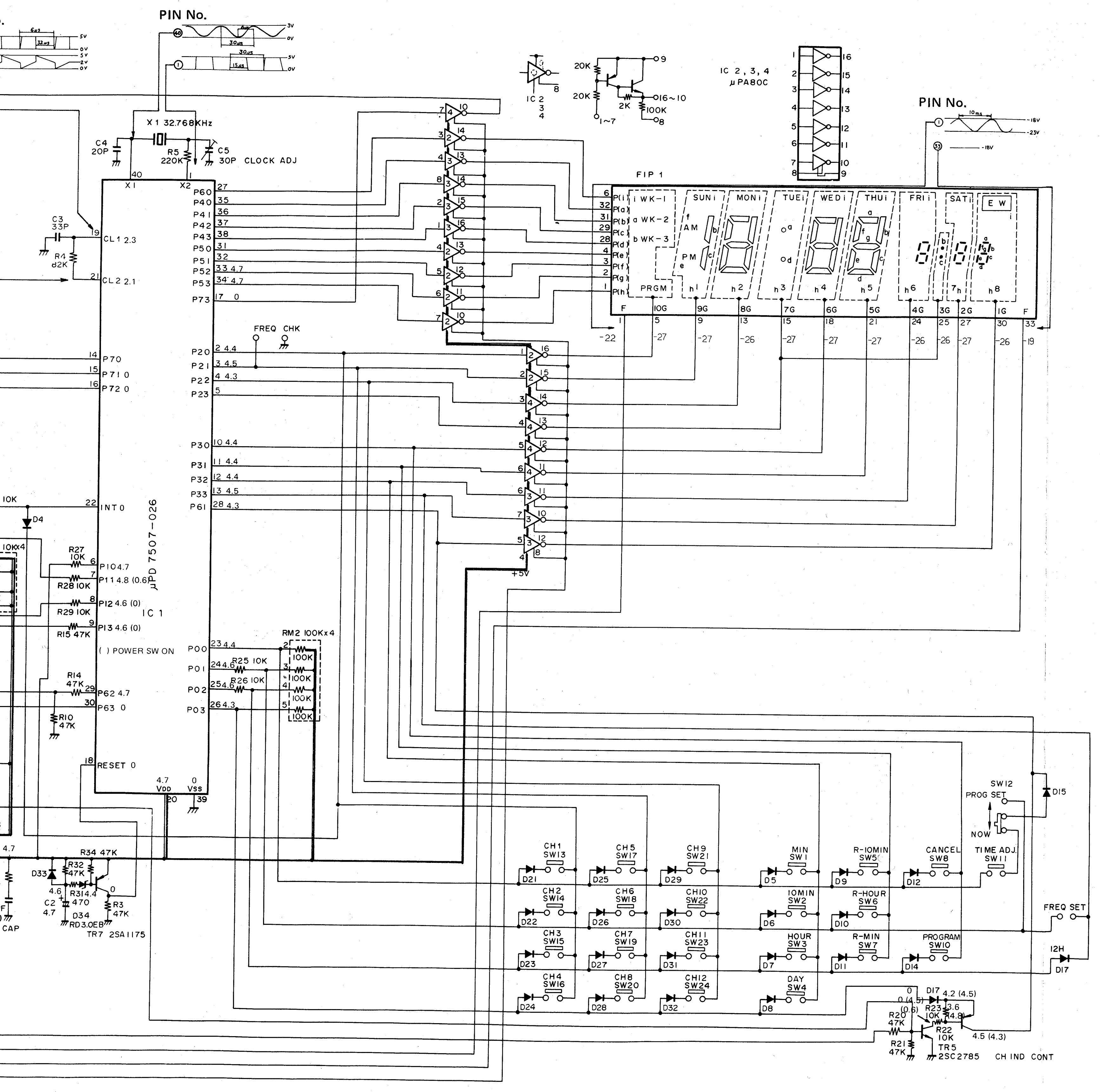

NEC FUNCTION PWV-422
SW1
SW2
SW3
SW4
SW5
SW6
SW7
SW8
SW9
SW10
SW11
D1
D2
D3
D4
D5
D6
D7
D8
D9
D10
D11
D12
D13
D14
D15
IC1
IC2
CN1
CN2
CN3
CN4
CN5
CN6
TR1
B C E
VR1
TP1

TIMER (PWV-425) CIRCUIT

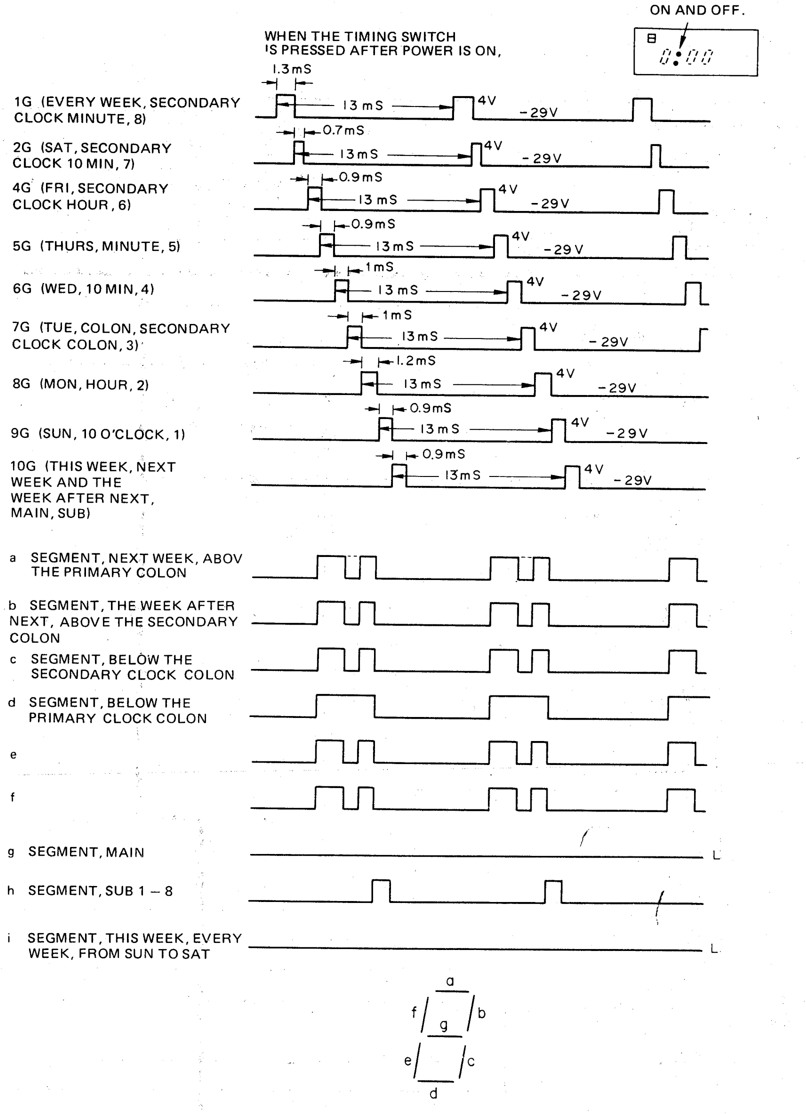


PIN No.
PIN No.
PIN No.
INDICATOR ON
CN1
CH1
CH2
CH3
CH4
CH5
CH6
CH7
CH8
CH9
CH10
CH11
CH12
TO PST PWB CN1
D51~62 TLG113
R24 100
CH INDICATOR
R33 4.7K
CN2
CH UP
CH DOWN
IND CONT
GND
EVER 12V
TO PST PWB CN2
CN3
EVER 12V
POWER SW H
TIMER SW L
CHLP H IN
REC-H IN
PAUSE H IN
GND
FROM FUNCTION CN1
(0) POWER SW ST-BY
4.7 (0.6) POWER SW ON
0 (8.6) REC
0 (8.8) PAUSE
RM1 10Kx4
R16 10K
D4
R8 47K
R6 47K
TR3 2SC2785
TR2 2SC2785
PAUSE
REC
R35 82K
R14 47K
D18
R11 3.3K
R10 47K
R36 1K
CN4
POWER CONT H
EVER 12V
GND
FIP Ef 0V
FIP Ef 3.2V
-28V
REG
11.1 (0) POWER SW ST-BY
D1 6.2V ZENER
R1 4.7K
TR1 2SD774
D2
D3
R2 100
C1 0.022F (5.5V) SUPER CAP
D33
R32 47K
R31 470
C2 4.7
D34 RD3.0EB
R34 47K
R3 47K
TR7 2SA1175
X1 32.768KHz
C4 20P
R5 220K
C5 30P CLOCK ADJ
C3 33P
R4 82K
μPD 7507-026
IC1
X1
X2
CL1
CL2
P60
P40
P41
P42
P43
P50
P51
P52
P53
P73
P70
P71
P72
P20
P21
P22
P23
P30
P31
P32
P33
P61
INT0
P10
P11
P12
P13
( ) POWER SW ON
P62
P63
RESET
VDD
VSS
P00
P01
P02
P03
R27 10K
R28 10K
R29 10K
R15 47K
RM2 100Kx4
R25 10K
R26 10K
FREQ CHK
IC 2, 3, 4
μPA80C
20K
20K
2K
100K
FIP 1
WK-1
WK-2
WK-3
AM
PM
PRGM
SUN
MON
TUE
WED
THU
FRI
SAT
E W
+5V
CH1 SW13
CH5 SW17
CH9 SW21
MIN SW1
R-10MIN SW5
CANCEL SW8
TIME ADJ. SW11
CH2 SW14
CH6 SW18
CH10 SW22
10MIN SW2
R-HOUR SW6
CH3 SW15
CH7 SW19
CH11 SW23
HOUR SW3
R-MIN SW7
PROGRAM SW10
CH4 SW16
CH8 SW20
CH12 SW24
DAY SW4
SW12 PROG SET
NOW
D15
FREQ SET
12H
D17
R20 47K
R21 47K
R23 10K
R22 10K
TR5 2SC2785
CH IND CONT

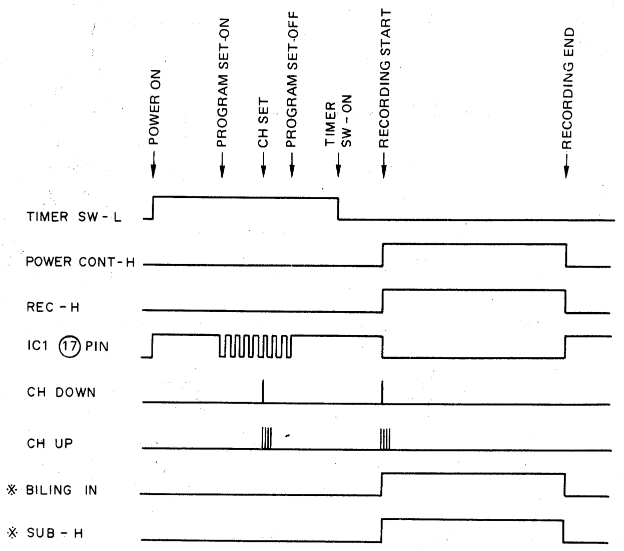
TIMER (PWV-425) CIRCUIT


PIN No.
X1 32.768KHz
C4 20P
R5 220K
C5 30P CLOCK ADJ
C3 33P
R4 d2K
CL1 2.3
CL2 2.1
P60
P40
P41
P42
P43
P50
P51
P52
P53
P73
P70
P71 0
P72 0
P20
P21
P22
P23
P30
P31
P32
P33
P61
INT0
P10 4.7
P11 4.8 (0.6)
P12 4.6 (0)
P13 4.6 (0)
( ) POWER SW ON
P00
P01
P02
P03
P62 4.7
P63 0
RESET 0
VDD
VSS
μPD 7507-026
IC 1
R27 10K
R28 10K
R29 10K
R15 47K
R14 47K
R10 47K
R25 10K
R26 10K
RM2 100Kx4
FREQ CHK
IC 2, 3, 4
μPA80C
FIP 1
WK-1
WK-2
WK-3
AM
PM
PRGM
SUN
MON
TUE
WED
THU
FRI
SAT
E W
10G
9G
8G
7G
6G
5G
4G
3G
2G
1G
PIN No.
CH1 SW13
CH2 SW14
CH3 SW15
CH4 SW16
CH5 SW17
CH6 SW18
CH7 SW19
CH8 SW20
CH9 SW21
CH10 SW22
CH11 SW23
CH12 SW24
MIN SW1
10MIN SW2
HOUR SW3
DAY SW4
R-10MIN SW5
R-HOUR SW6
R-MIN SW7
CANCEL SW8
PROGRAM SW10
TIME ADJ. SW11
SW12 PROG SET
NOW
D15
FREQ SET
12H
D17
R20 47K
R21 47K
R22 10K
R23 10K
TR5 2SC2785
CH IND CONT
R34 47K
R32 47K
R31 470
R3 47K
D33
D34
RD3.0EB
TR7 2SA1175
CAP
+5V

Timer display tube timing chart

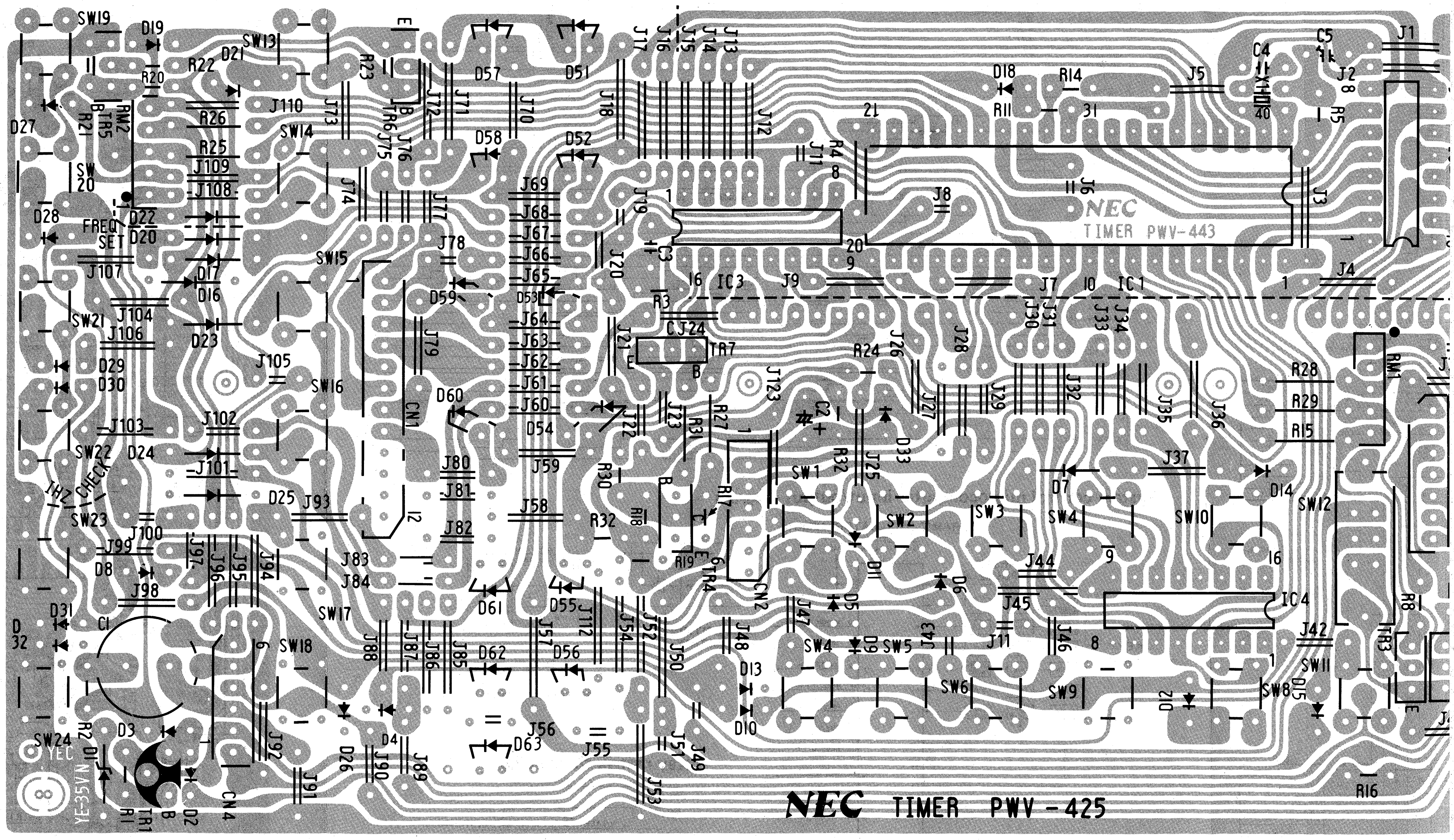


Timer recording timing chart



* IN CASE THE DUPLEX SOUND BROADCASTING IS RESERVED BY SUB.

TIMER PWB ASS'Y


NEC TIMER PWV-425
NEC TIMER PWV-443
YEC
YE-35V N
FREQ SET
1HZ CHECK
IC1
IC3
IC4
TR1
TR4
TR5
TR6
TR7
C1
C2
C3
C4
C5
CN1
CN2
CN4
X1
RM1
RM2
SW1
SW2
SW3
SW4
SW5
SW6
SW8
SW9
SW10
SW11
SW12
SW13
SW14
SW15
SW16
SW17
SW18
SW19
SW20
SW21
SW22
SW23
SW24
D1
D2
D3
D4
D5
D6
D7
D8
D9
D10
D11
D12
D13
D14
D15
D16
D17
D18
D19
D20
D21
D22
D23
D24
D25
D26
D27
D28
D29
D30
D31
D32
D33
D51
D52
D53
D54
D55
D56
D57
D58
D59
D60
D61
D62
D63
R1
R2
R3
R4
R5
R8
R11
R13
R14
R15
R16
R17
R18
R19
R20
R21
R22
R23
R24
R25
R26
R27
R28
R29
R30
R31
R32
J1
J2
J3
J4
J5
J6
J7
J8
J9
J11
J12
J13
J14
J15
J16
J17
J18
J19
J20
J21
J22
J23
J24
J25
J26
J27
J28
J29
J30
J31
J32
J33
J34
J35
J36
J37
J42
J43
J44
J45
J46
J47
J48
J49
J50
J51
J52
J53
J54
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J57
J58
J59
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J62
J63
J64
J65
J66
J67
J68
J69
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J71
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J73
J74
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J76
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J81
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J83
J84
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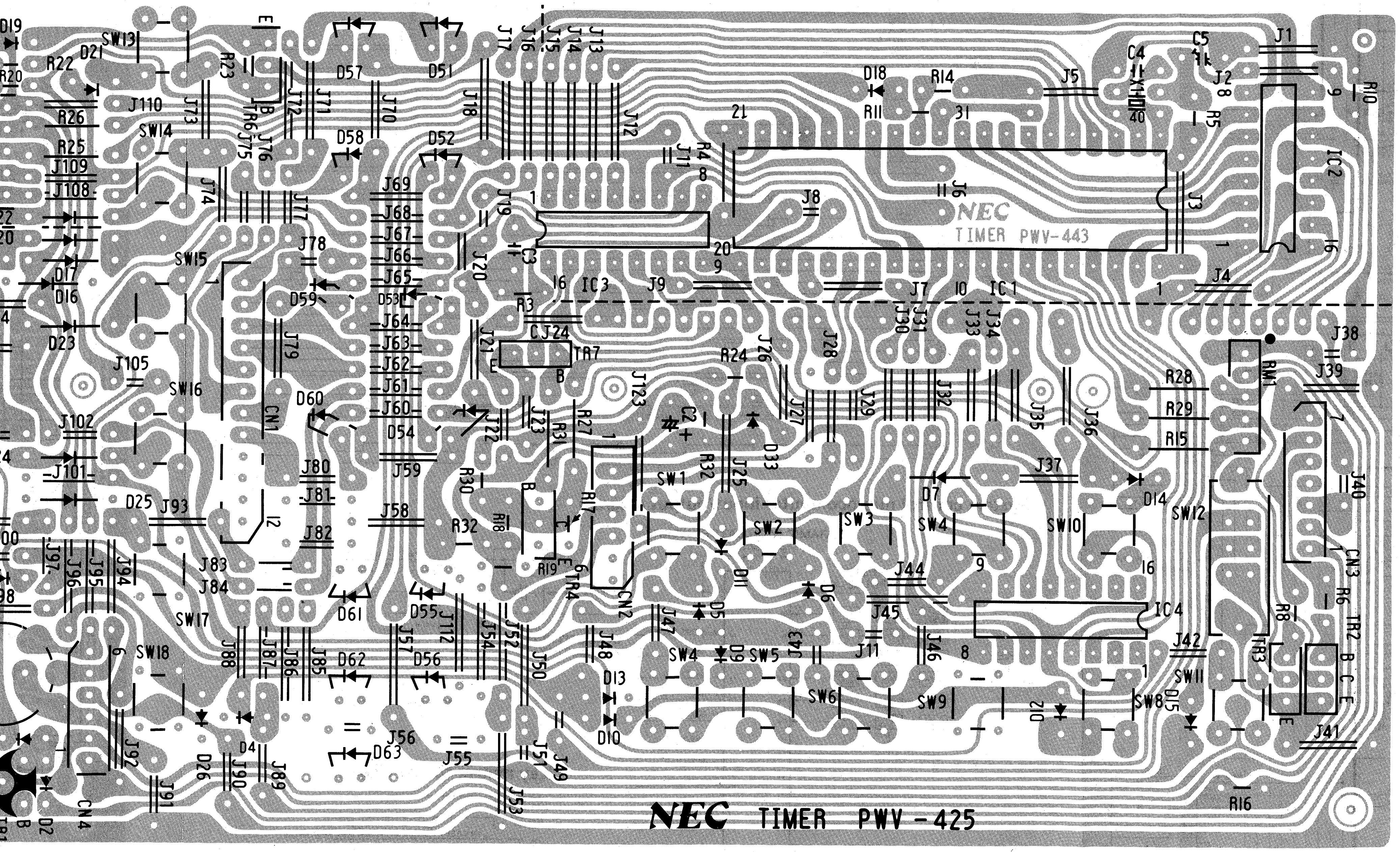
J87
J88
J89
J90
J91
J92
J93
J94
J95
J96
J97
J98
J99
J100
J101
J102
J103
J104
J105
J106
J107
J108
J109
J110
J112
J123
B
E
1
8
9
16
20
21
31
40

TIMER PWB ASS'Y



NEC TIMER PWV-425
NEC TIMER PWV-443
IC1
IC2
IC3
IC4
CN1
CN2
CN3
CN4
TR2
TR3
TR4
TR7
RM1
C2
C3
C4
C5
X1
D5
D6
D7
D9
D10
D11
D12
D13
D14
D15
D16
D17
D18
D19
D21
D23
D25
D26
D33
D51
D52
D53
D54
D55
D56
D57
D58
D59
D60
D61
D62
D63
R3
R4
R5
R6
R8
R10
R11
R14
R15
R16
R17
R18
R19
R20
R22
R23
R24
R25
R26
R27
R28
R29
R30
R31
R32
SW1
SW2
SW3
SW4
SW5
SW6
SW8
SW9
SW10
SW11
SW12
SW13
SW14
SW15
SW16
SW17
SW18
J1
J2
J3
J4
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J6
J7
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J11
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J14
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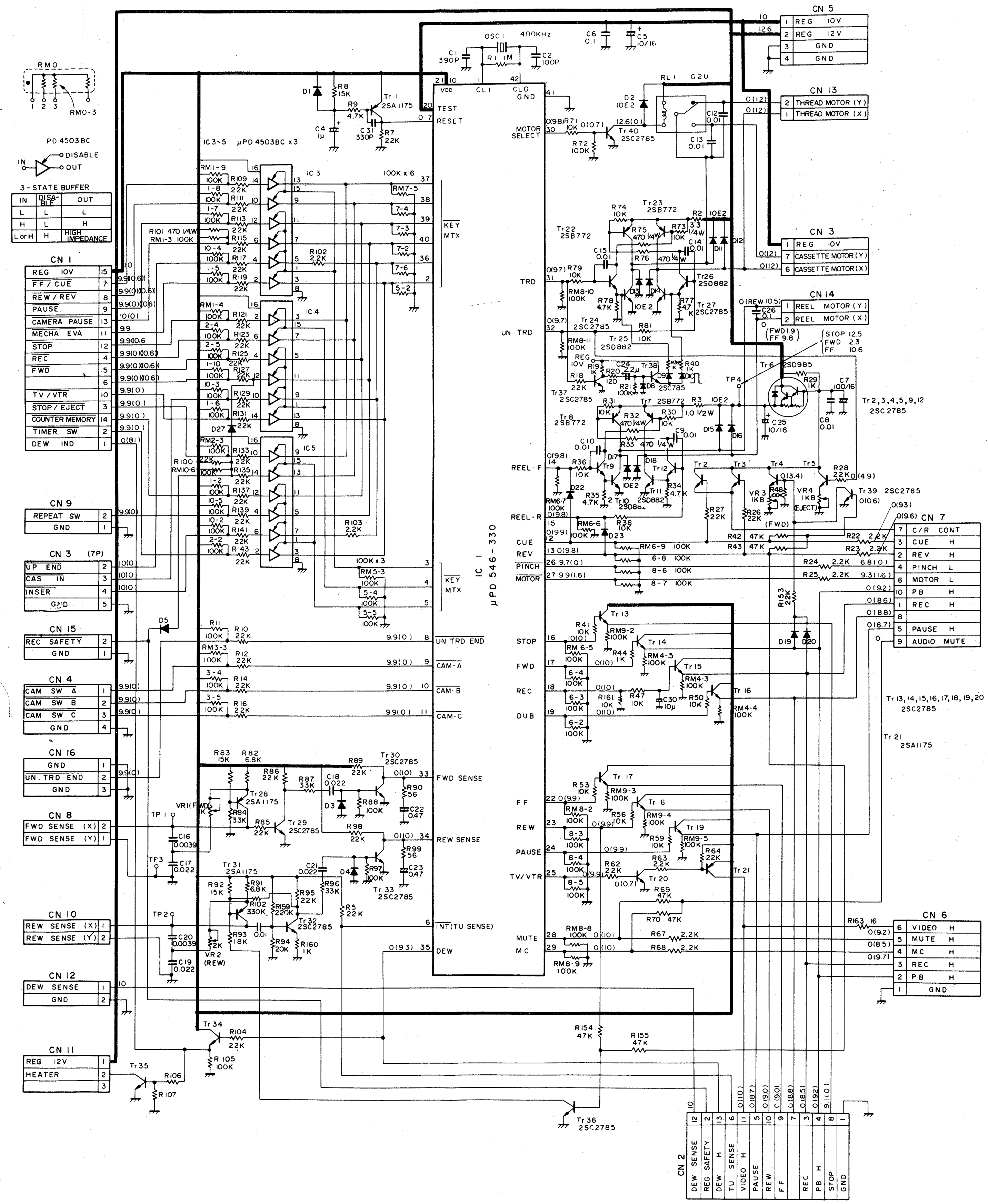
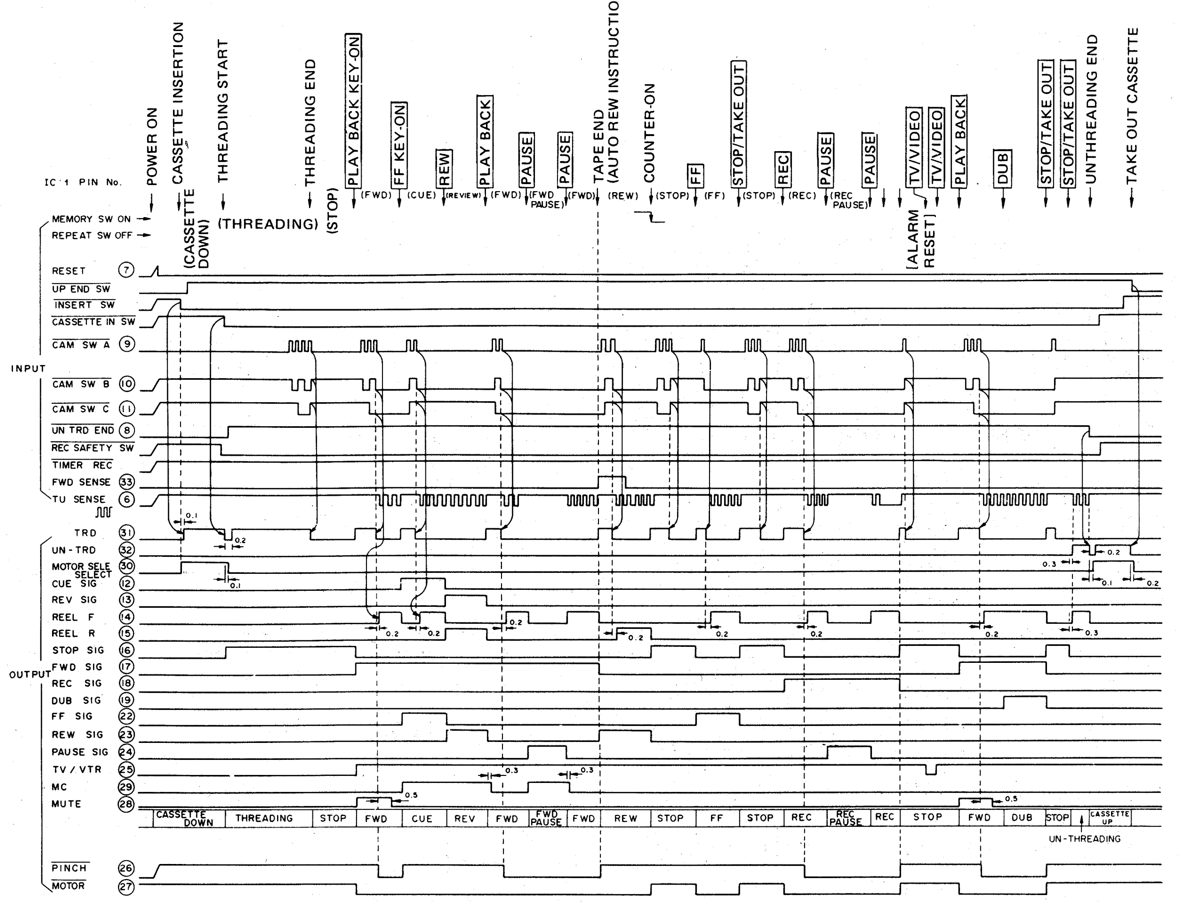
J75
J76
J77
J78
J79
J80
J81
J82
J83
J84
J85
J86
J87
J88
J89
J90
J91
J92
J93
J94
J95
J96
J97
J101
J102
J105
J108
J109
J110
J112
B
C
E

SYSCON CIRCUIT (PWV-423)

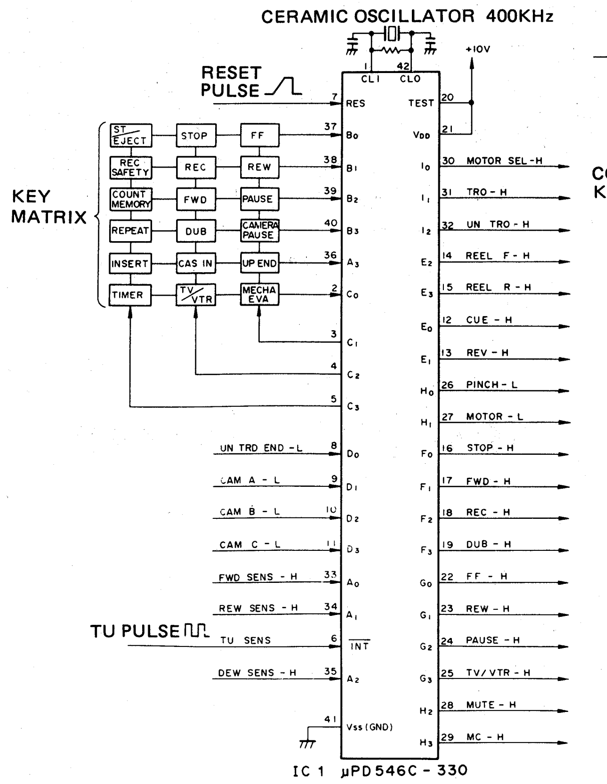

RMO
RMO-3
PD 4503BC
DISABLE
IN
OUT
3-STATE BUFFER
CN 1
REG 10V
FF/CUE
REW/REV
PAUSE
CAMERA PAUSE
MECHA EVA
STOP
REC
FWD
TV/VTR
STOP/EJECT
COUNTER MEMORY
TIMER SW
DEW IND
CN 9
REPEAT SW
GND
CN 3 (7P)
UP END
CAS IN
INSER
GND
CN 15
REC SAFETY
CN 4
CAM SW A
CAM SW B
CAM SW C
CN 16
UN.TRD END
CN 8
FWD SENSE (X)
FWD SENSE (Y)
CN 10
REW SENSE (X)
REW SENSE (Y)
CN 12
DEW SENSE
CN 11
REG 12V
HEATER
IC3-5 μPD 4503BC x3
IC 3
IC 4
IC 5
100K x 6
KEY MTX
OSC 1 400KHz
TEST
RESET
MOTOR SELECT
IC 1 μPD 546-330
TRD
UN TRD
REEL·F
REEL·R
CUE
REV
PINCH
MOTOR
STOP
FWD
REC
DUB
FF
REW
PAUSE
TV/VTR
MUTE
MC
UN TRD END
CAM-A
CAM-B
CAM-C
FWD SENSE
REW SENSE
INT (TU SENSE)
DEW
CN 5
REG 10V
REG 12V
GND
CN 13
THREAD MOTOR (Y)
THREAD MOTOR (X)
CN 3
CASSETTE MOTOR (Y)
CASSETTE MOTOR (X)
CN 14
REEL MOTOR (Y)
REEL MOTOR (X)
CN 7
C/R CONT
CUE H
REV H
PINCH L
MOTOR L
PB H
REC H
PAUSE H
AUDIO MUTE
CN 6
VIDEO H
MUTE H
MC H
REC H
PB H
GND
CN 2
DEW SENSE
REG SAFETY
DEW H
TU SENSE
VIDEO H
PAUSE
REW
FF
REC
PB H
STOP
GND
Tr 2,3,4,5,9,12 2SC2785
Tr 13,14,15,16,17,18,19,20 2SC2785
Tr 21 2SA1175

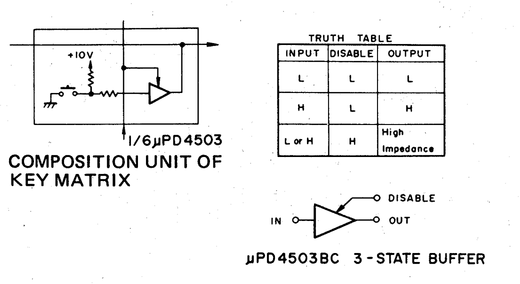
IN	DISA-BLE	OUT
L	L	L
H	L	H
L or H	H	HIGH IMPEDANCE

System control timing chart



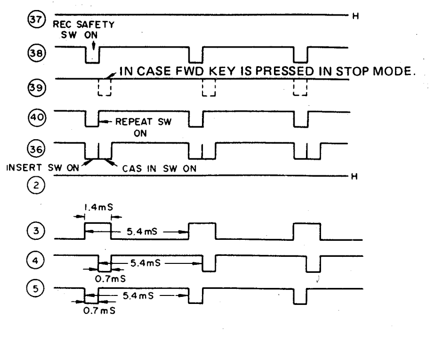
System control microcomputer input/output diagram


CERAMIC OSCILLATOR 400KHz
+10V
RESET PULSE
KEY MATRIX
ST/EJECT
STOP
FF
REC SAFETY
REC
REW
COUNT MEMORY
FWD
PAUSE
REPEAT
DUB
CAMERA PAUSE
INSERT
CAS IN
UP END
TIMER
TV/VTR
MECHA EVA
UN TRD END - L
CAM A - L
CAM B - L
CAM C - L
FWD SENS - H
REW SENS - H
TU PULSE
TU SENS
DEW SENS - H
RES
TEST
VDD
CL1
CL0
30 MOTOR SEL - H
31 TRD - H
32 UN TRD - H
14 REEL F - H
15 REEL R - H
12 CUE - H
13 REV - H
26 PINCH - L
27 MOTOR - L
16 STOP - H
17 FWD - H
18 REC - H
19 DUB - H
22 FF - H
23 REW - H
24 PAUSE - H
25 TV/VTR - H
28 MUTE - H
29 MC - H
VSS (GND)
IC 1 μPD546C - 330

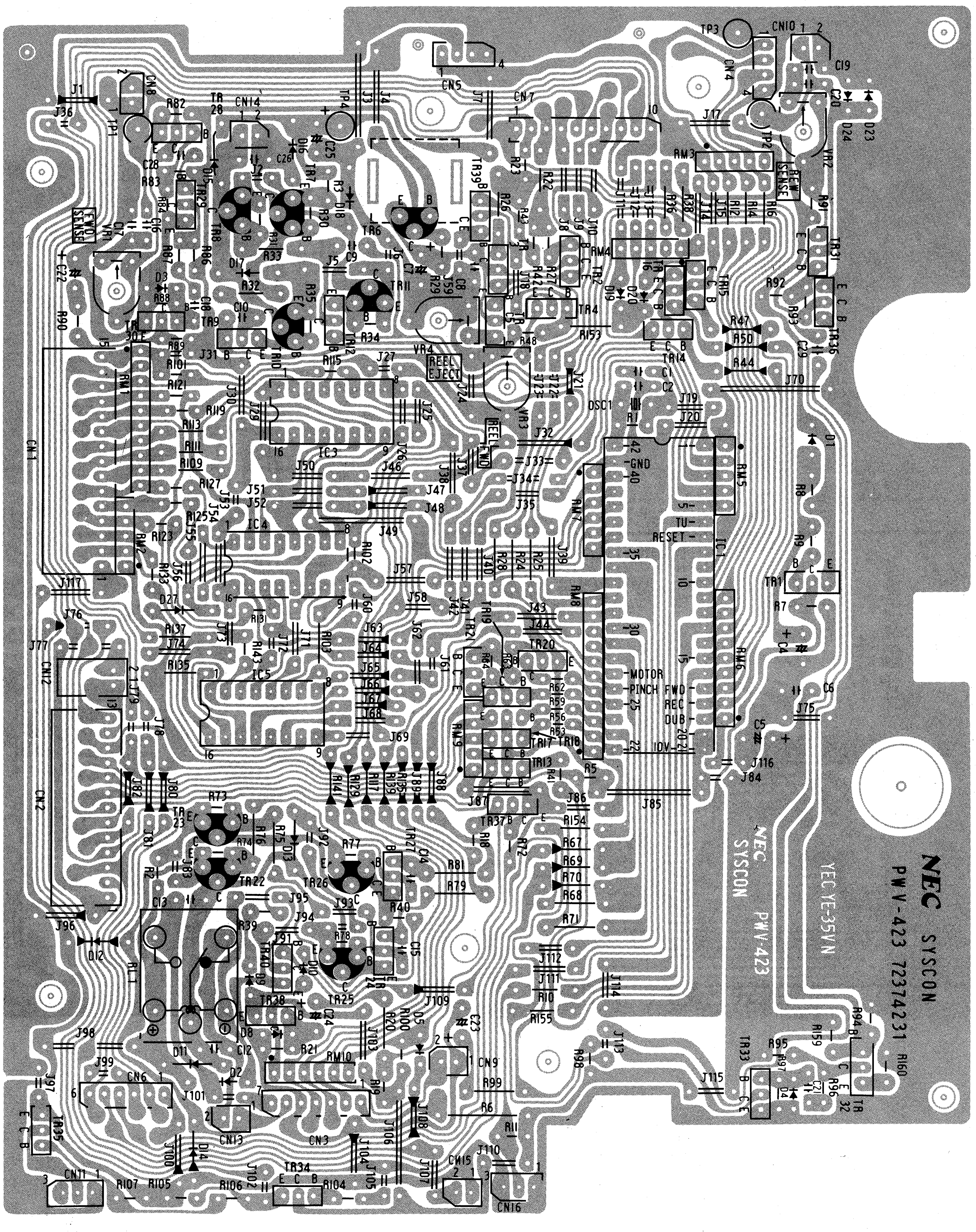

+10V
1/6μPD4503
COMPOSITION UNIT OF KEY MATRIX
TRUTH TABLE
DISABLE
IN
OUT
μPD4503BC 3-STATE BUFFER

INPUT	DISABLE	OUTPUT
L	L	L
H	L	H
L or H	H	High Impedance

Key matrix timing chart

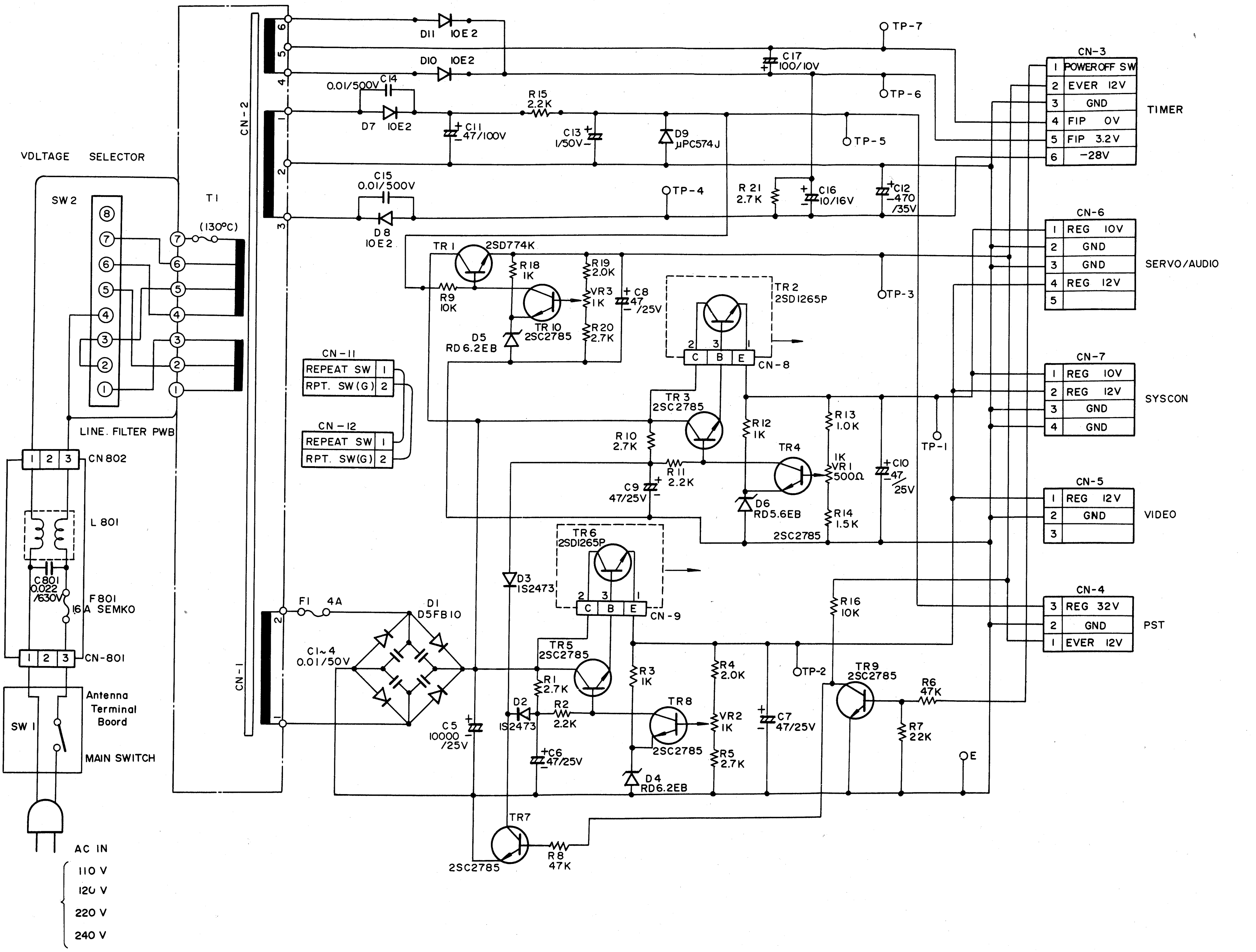


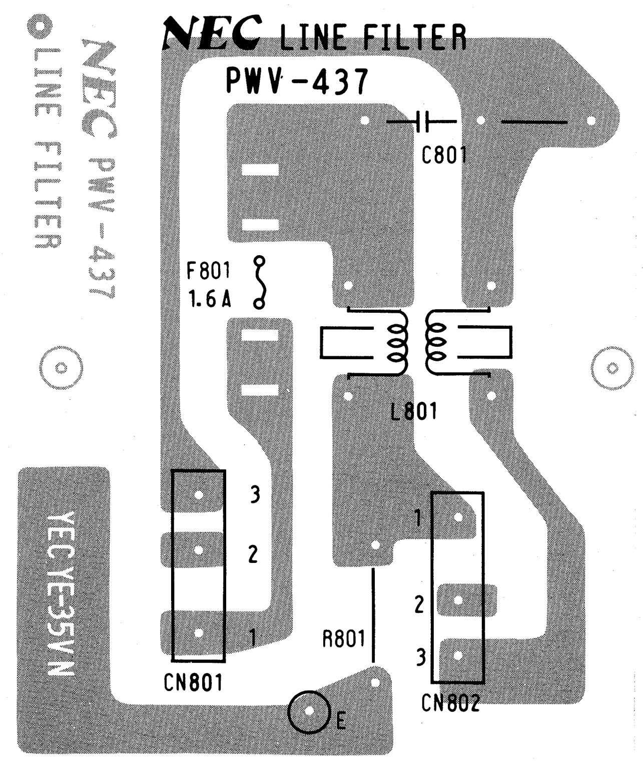
SYSCON (PWV-423) PWB ASS'Y


NEC SYSCON
PWV-423 72374231
NEC SYSCON PWV-423
YEC YE-35VN
FWD SENSE
REW SENSE
REEL EJECT
REEL FWD
GND
TU-RESET
MOTOR
PINCH FWD
REC
DUB
10V
IC1
IC3
IC4
IC5
CN1
CN2
CN3
CN4
CN5
CN6
CN7
CN8
CN9
CN10
CN11
CN12
CN13
CN14
CN15
CN16
OSC1
RL1
TP1
TP2
TP3
TP4
VR1
VR2
VR3
VR4

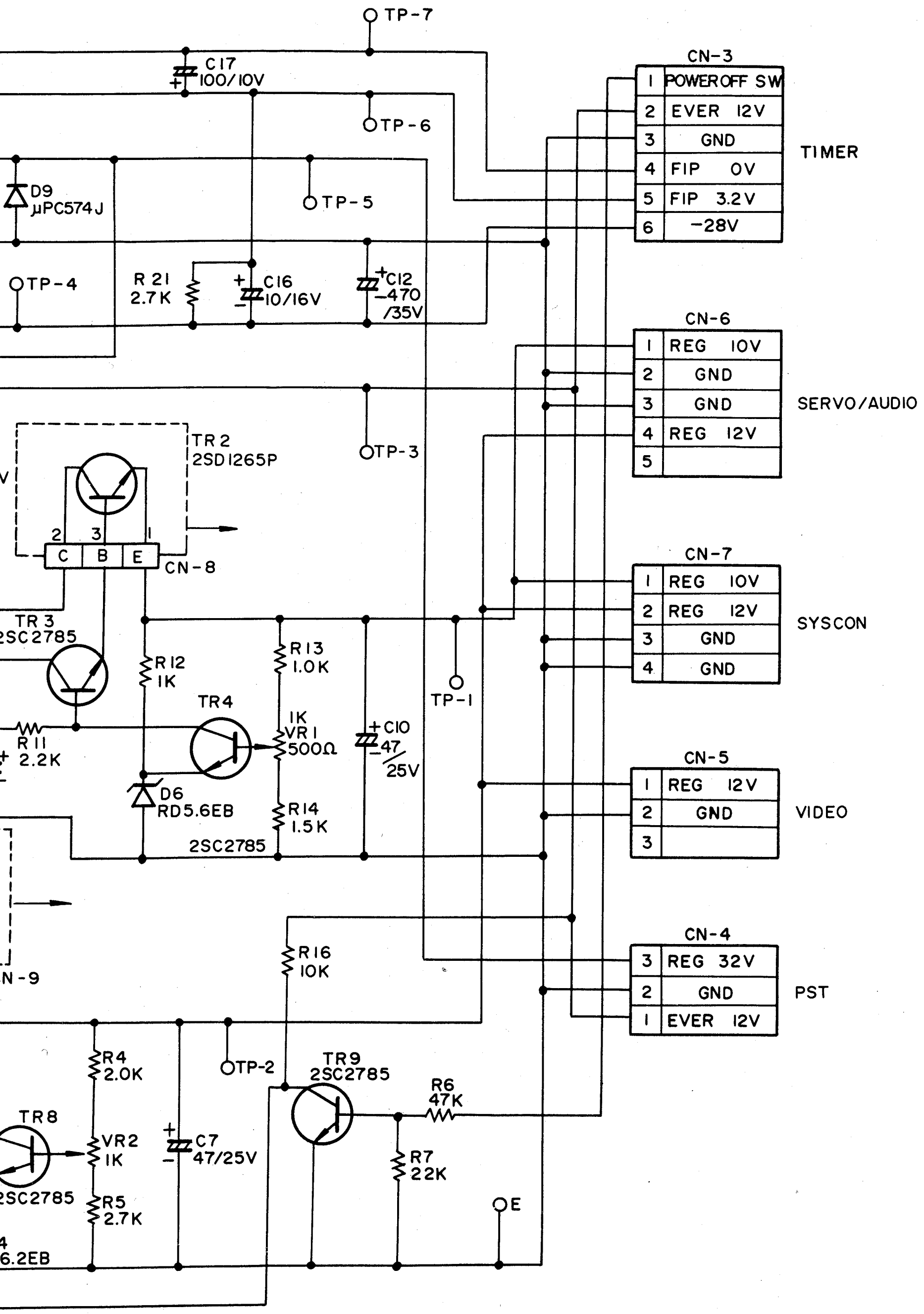
REGULATOR (PWV-438)/LINE FILTER (PWV-437) CIRCUITS

REGULATOR (PWV-438)/LIN

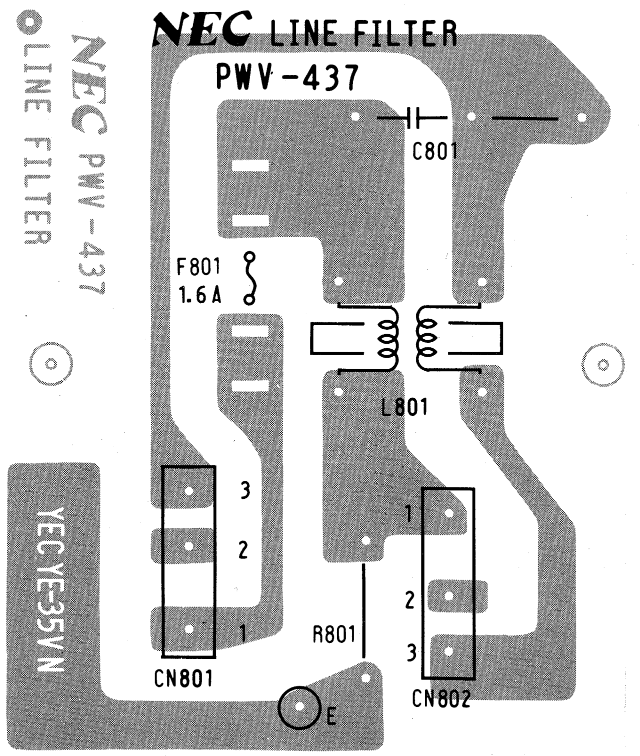

VDLTAGE SELECTOR
SW2
T1
(130°C)
CN-2
CN-1
D11 10E2
D10 10E2
C14 0.01/500V
D7 10E2
C11 47/100V
R15 2.2K
C13 1/50V
D9 μPC574J
C15 0.01/500V
D8 10E2
C17 100/10V
TP-7
TP-6
TP-5
TP-4
R21 2.7K
C16 10/16V
C12 470/35V
TR1 2SD774K
R9 10K
R18 1K
R19 2.0K
VR3 1K
C8 47/25V
R20 2.7K
TR10 2SC2785
D5 RD6.2EB
TR2 2SD1265P
TP-3
CN-8
C B E
CN-11
REPEAT SW 1
RPT. SW(G) 2
CN-12
REPEAT SW 1
RPT. SW(G) 2
TR3 2SC2785
R10 2.7K
R11 2.2K
C9 47/25V
R12 1K
TR4
D6 RD5.6EB
R13 1.0K
VR1 1K 500Ω
R14 1.5K
2SC2785
C10 47/25V
TP-1
LINE. FILTER PWB
CN802
L801
C801 0.022/630V
F801 1.6A SEMKO
CN-801
SW1
Antenna Terminal Boord
MAIN SWITCH
AC IN
110V
120V
220V
240V
F1 4A
D1 D5FB10
C1~4 0.01/50V
C5 10000/25V
D3 1S2473
TR6 2SD1265P
CN-9
TR5 2SC2785
R1 2.7K
D2 1S2473
R2 2.2K
C6 47/25V
R3 1K
TR8 2SC2785
D4 RD6.2EB
R4 2.0K
VR2 1K
R5 2.7K
C7 47/25V
TP-2
R16 10K
TR9 2SC2785
R6 47K
R7 22K
E
TR7 2SC2785
R8 47K
CN-3
1 POWER OFF SW
2 EVER 12V
3 GND
4 FIP 0V
5 FIP 3.2V
6 -28V
TIMER
CN-6
1 REG 10V
2 GND
3 GND
4 REG 12V
5
SERVO/AUDIO
CN-7
1 REG 10V
2 REG 12V
3 GND
4 GND
SYSCON
CN-5
1 REG 12V
2 GND
3
VIDEO
CN-4
3 REG 32V
2 GND
1 EVER 12V
PST

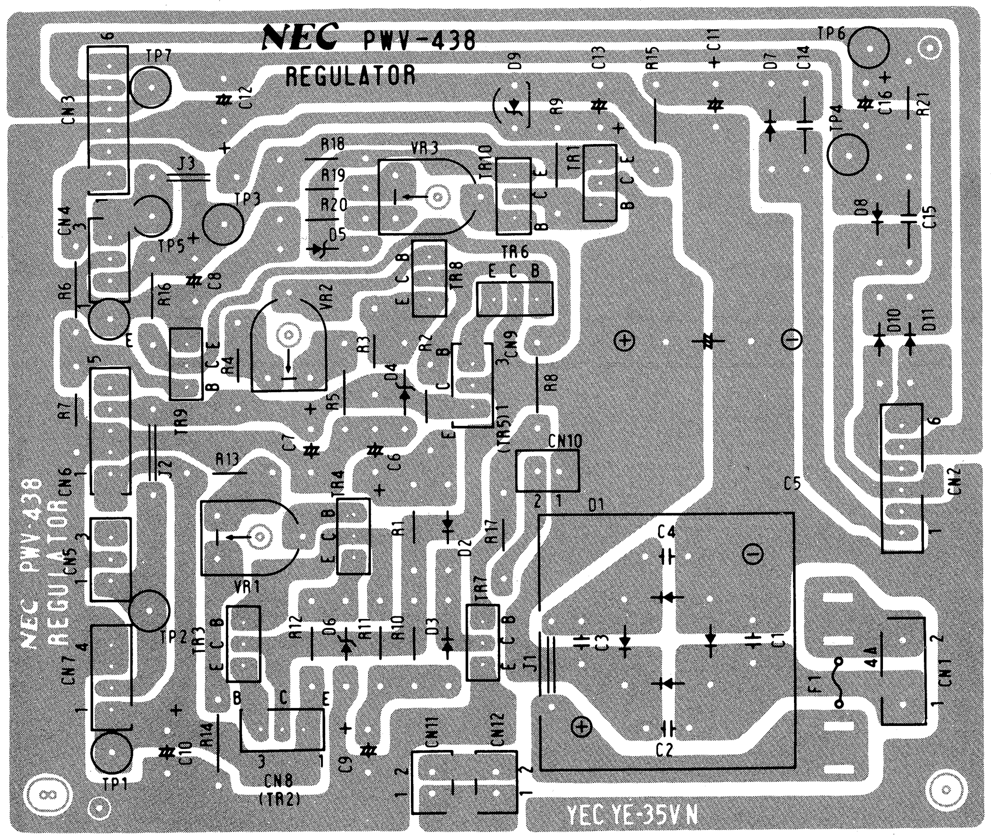

NEC LINE FILTER
PWV-437
NEC PWV-437
LINE FILTER
C801
F801 1.6A
L801
YECYE-35VN
CN801
CN802
R801
E
1 2 3

TER (PWV-437) CIRCUITS


TP-7
C17 100/10V
TP-6
D9 µPC574J
TP-5
TP-4
R21 2.7K
C16 10/16V
C12 470 /35V
CN-3
1 POWER OFF SW
2 EVER 12V
3 GND
4 FIP 0V
5 FIP 3.2V
6 -28V
TIMER
CN-6
1 REG 10V
2 GND
3 GND
4 REG 12V
5
SERVO/AUDIO
TR2 2SD1265P
TP-3
CN-8
C B E
TR3 2SC2785
R12 1K
R13 1.0K
TR4
1K VR1 500Ω
C10 47 25V
TP-1
R11 2.2K
D6 RD5.6EB
R14 1.5K
2SC2785
CN-7
1 REG 10V
2 REG 12V
3 GND
4 GND
SYSCON
CN-5
1 REG 12V
2 GND
3
VIDEO
R16 10K
N-9
CN-4
3 REG 32V
2 GND
1 EVER 12V
PST
R4 2.0K
TP-2
TR9 2SC2785
R6 47K
TR8
VR2 1K
C7 47/25V
R7 22K
2SC2785
R5 2.7K
E
6.2EB

REGULATOR (PWV-438)/LINE FILTER (PWV-437) PWB ASS'Y


NEC LINE FILTER
PWV-437
NEC PWV-437
LINE FILTER
C801
F801 1.6A
L801
YEC YE-35V N
3
2
1
CN801
R801
1
2
3
CN802
E


NEC PWV-438
REGULATOR
TP7
TP6
TP3
TP4
TP5
TP2
TP1
CN3
CN4
CN5
CN6
CN7
CN8 (TR2)
CN9
CN10
CN11
CN12
CN1
CN2
VR1
VR2
VR3
TR1
TR4
TR5
TR6
TR7
TR8
TR9
TR10
D1
D2
D3
D4
D5
D6
D7
D8
D9
D10
D11
C1
C2
C3
C4
C5
C6
C7
C8
C9
C10
C11
C12
C13
C14
C15
C16
R1
R2
R3
R4
R5
R6
R7
R8
R9
R10
R11
R12
R13
R14
R15
R16
R17
R18
R19
R20
R21
J1
J2
J3
F1 4A
NEC PWV-438 REGULATOR
YEC YE-35V N

SECTION 2

MECHANICAL MAINTENANCE

2-1. DISASSEMBLY

2-1-1. Removal and Reassembly of Cabinet

1. How to Remove Cabinet

(1) Remove four screws ① for top cover assembly and disassemble the top cover assembly with it moved in the direction of an arrow.
Then put the set upright.

(2) Remove five screws ② and remove the bottom plate.
Then put the set back in position.

(3) Remove three screws ③ for front panel assembly.
Also remove one screw ④ for front panel assembly.

2. Note on Assembling and Disassembling

The front panel assembly and the bottom plate are secured together by means of screws ⑤.

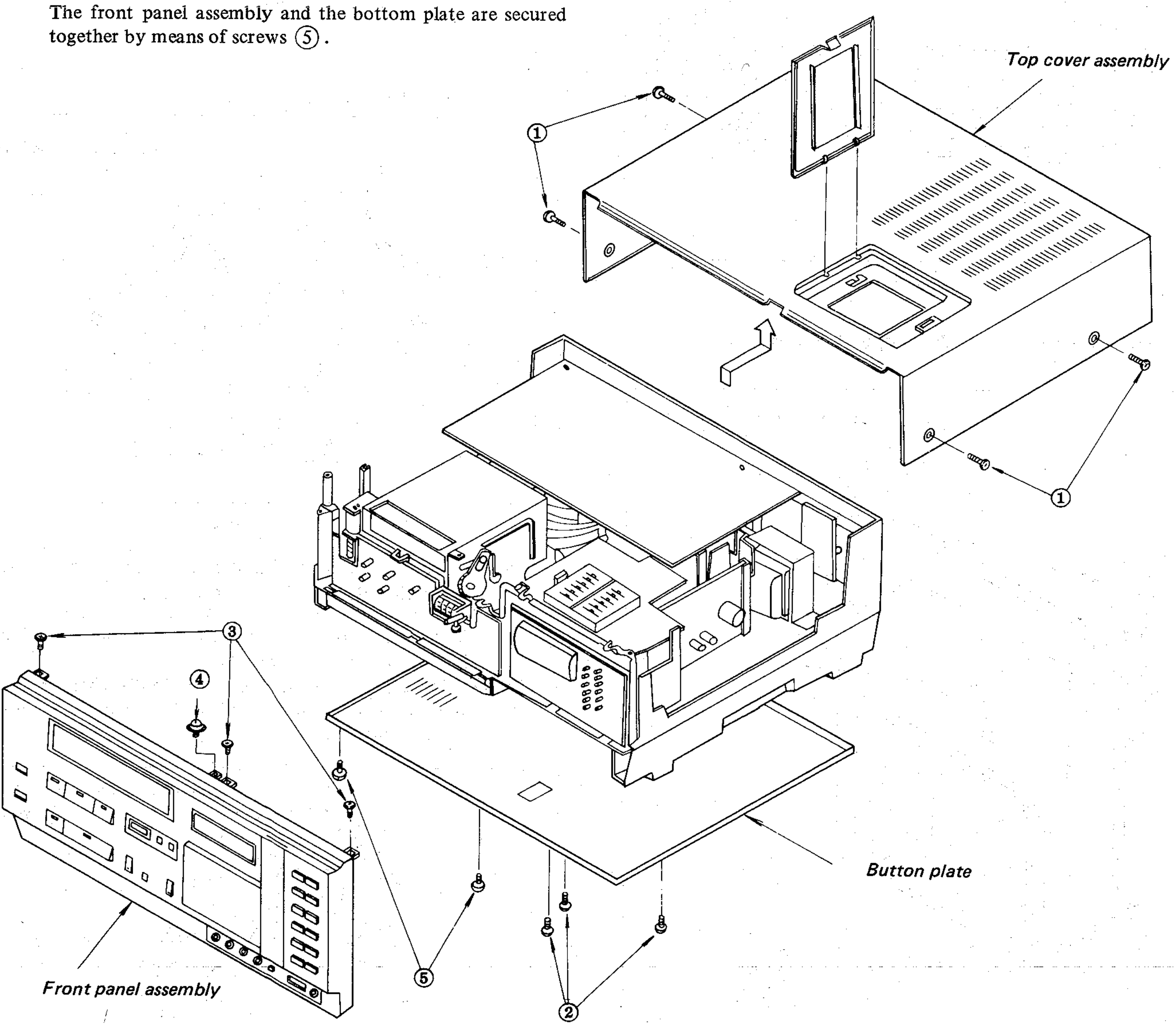


Fig. 2-1. Removal and Re-assembly of Cabinet

2-1-2. How to Remove the Cassette Housing

Note:

1. Remove one connector.
2. Remove four screws.

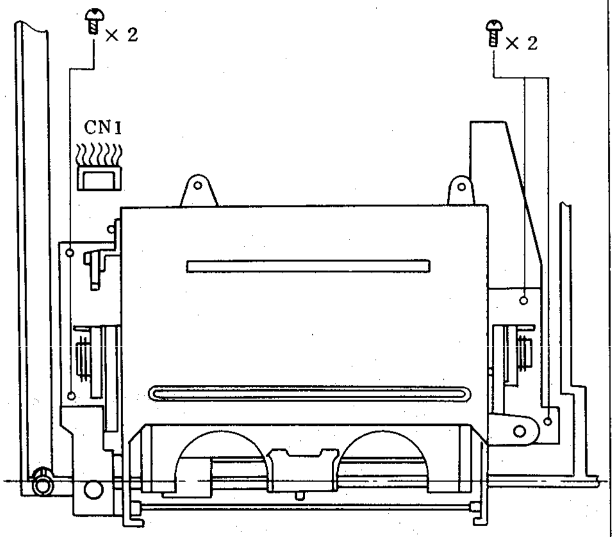


Fig. 2-2.

2-1-3. How to Remove Syscon, S/A Board

Note: Do not open more than 90°.

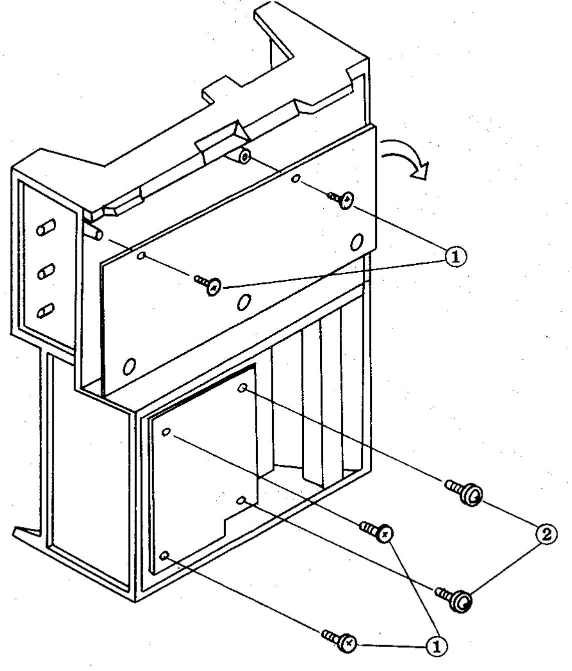


Fig. 2-3.

2-2. OPERATING THE RECORDER WITHOUT CASSETTE INSTALLED

2-2-1. How to do Threading

ⓐ Make front threading.

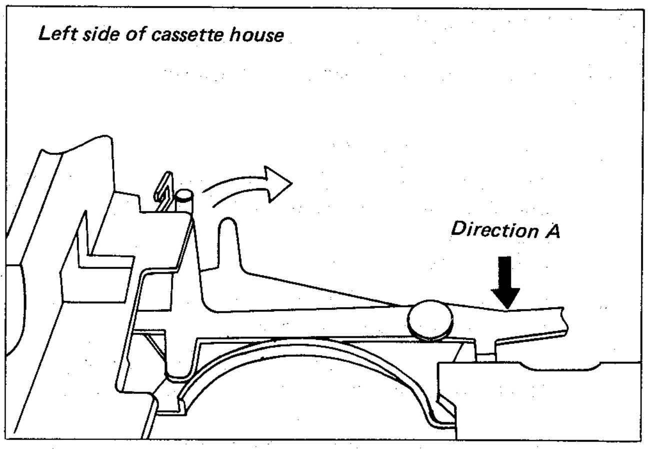

Left side of cassette house
Direction A

Fig. 2-4.

ⓑ Press the Treading ON switch

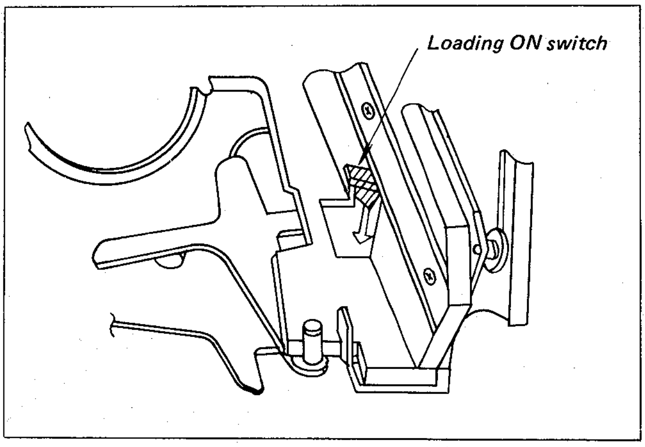

Loading ON switch

Fig. 2-5.

2-2-2. How to Establish/Playback, Fast Forward, and Rewind States Without Cassette

- Press the Threading ON SW shown in Fig. 2-5 above (this switch needs not be held). Then press desired function button to select each state desired.

2-2-3. How to Establish Recording State without Cassette

Press the REC button while keeping the erratic erasure prevention switch pressed.

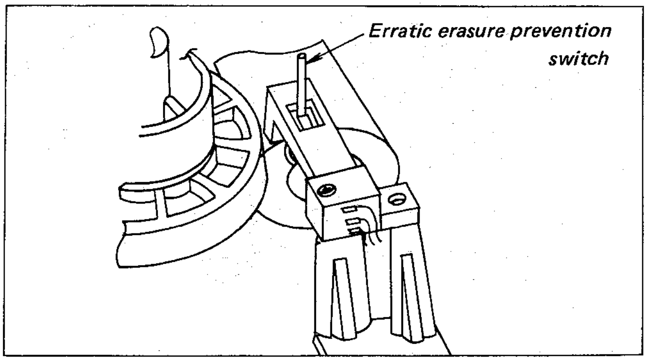

Erratic erasure prevention switch

Fig. 2-6.

2-3. Beta-JIG KIT (3) LIST (Model 700 series) KIT CODE: 349-4005

Sketch No.	Description	Fixture No.	Code No.	Q'ty	Remark
①	Angle for upper Drum alignment fixture (eccentricity gauge)	SL-0027	16950901	1	☆ ○
② + ③	Upper head drum alignment fixture (eccentricity gauge)	SL-0012	16950821	1	○
④	Tension gauge (reel table)	SL-0011	16950911	1	☆ ○
⑤	Forward back tension measurement fixture	SL-0002	16950741	1	○
⑥	Tension gauge (max. 100 g)		16950841	1	○
	Tension gauge (max. 200 g)		16950851	1	○
	Tension gauge (max. 500 g)		16950861	1	○
	Tension gauge (max. 50 g)		16950921	1	☆ ○
⑦	Inspection mirror holder Inspection mirror top		16950871	1	○
⑧	Dihedral adjustment screw	SL-0013	16950831	1	○
⑨	Cassette reference plate	SL-0008	16950801	1	○
⑩	Semi-fixed coil adjustment tool	SL-0001	16950731	1	○
	Tool case (with cushion)		16950931	1	
⑪	Alignment tape	See below		1	
	Total			14	

Alignment tape

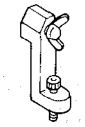
Add the alignment tape to the jig kit.

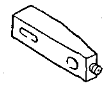
Sketch No.	Description	Fixture No.	Code No.	Q'ty
⑪	Alignment tape KR5-2H . .PAL (and Q-version)		346-9019	1

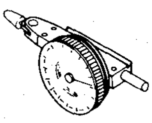
Note:

☆ . . . . .If you already have a jig kit for model PVC-2300/2400, it can be used for model 700 series jig kit by adding the three items marked with "☆".

○ . . . . .Items marked with "○" are stocked separately besides the jig kit.

①


②


③


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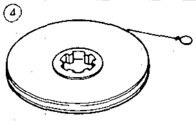
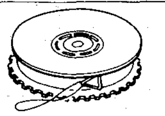


⑤


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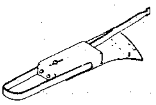

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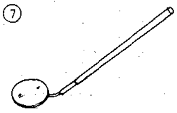

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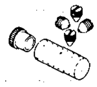

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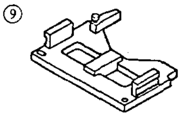

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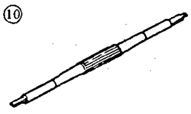
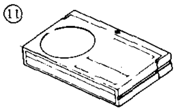
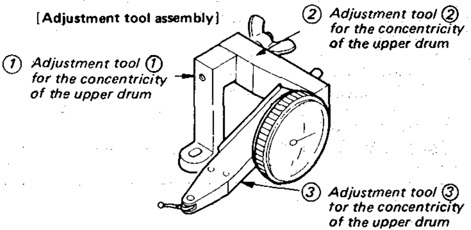


⑪



[Adjustment tool assembly]
② Adjustment tool ② for the concentricity of the upper drum
① Adjustment tool ① for the concentricity of the upper drum
③ Adjustment tool ③ for the concentricity of the upper drum

Assembly of upper head drum
Alignment fixture

2-4. PERIODIC CHECK AND MAINTENANCE

It is recommended that the following periodic check and maintenance be performed for obtaining the full function and performance of the machine and extending the lives of the machine and tape.

2-4-1. Maintenance After Repair

The following maintenance items must be performed after repair of the machine without regard to the operating hours of the machine.

(1) Cleaning of the video head disk assembly

- Press chamois saturated with isopropyl alcohol lightly on the video head disk assembly and turn the fan on the drum slowly by hand for cleaning. (Never try to clean the video head disk assembly with the motor running.)
- Never move the chamois vertically against the head tips for cleaning, or the head tips will be damaged.

(2) Cleaning of the tape movement system
Clean the surfaces which the tape contacts during its movement (the tape guides, drum assembly, capstan, and pinch roller) with chamois saturated with isopropyl alcohol.

(3) Cleaning of the driving system
Clean the driving elements (such as belts, idlers, and reel table surfaces) with a piece of cloth saturated with isopropyl alcohol.

2-4-2. Periodic Check Items

Perform the maintenance and check listed on the table below, according to user's operating hours.

○ Cleaning ◎ Lubrication ★ Replacement ☆ Confirmation

	Operating Hour (H) Maintenance & Check	Replacement Part No.	500	1000	1500	2000	2500	3000	3500	4000	4500	5000	Remarks
Tape Movement System	Cleaning of tape movement system	–	○	○	○	○	○	○	○	○	○	○	This cleaning must be done whenever a repair is made.
	Cleaning & degaussing of ACE ass'y	–	○	○	○	○	○	○	○	○	○	○	
	Cleaning, degaussing & replacement of video head disk ass'y		○	★	○	★	○	★	○	★	○	★	The life of a head varies, depending on operational conditions and methods.
Driving System	Lubrication to thrust retainer	–	–	◎	–	◎	–	◎	–	◎	–	◎	Apply a drop of oil (such as sewing machine oil) on each of upper and lower bearings.
	Lubrication to thrust bearing (under reel table)	–	–	–	◎	–	–	◎	–	–	◎	–	Remove reel table and apply a drop of oil (such as sewing machine oil) on thrust bearing.
	Cleaning & replacement of capstan belt	16429592	○	○	★	○	○	★	○	○	★	○	• Cleaning must be done whenever repair is made. • Replacement must be done depending on operating hours on the table, or every two years.
	Cleaning & replacement of belts other than capstan belt	–	○	○	○	○	○	○	○	★	○	○	
Performance Confirmation	Abnormal sound	–	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	Adjust or replace the section which makes abnomal sound.
	Measurement of FWD back tension	–	–	☆	–	☆	–	☆	–	☆	–	☆	Confirmation must be made according to Section 3-15. Specified value: 40 to 50 g (when measured with jig tape)
	Confirmation of brake system	–	–	☆	–	☆	–	☆	–	☆	–	☆	Confirmation must be made according to Section 3-13.
	Confirmation of record & playback functions	–	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	Perform the confirmation whenever repair is made.
	FF/REW, idler cleaning and replacement	16172932	○	○	○	★	○	○	○	★	○	○	

- Belts other than capstan belt

  Threading belt : 16432191
  Counter belt : 16432421

(Note on Overhaul)

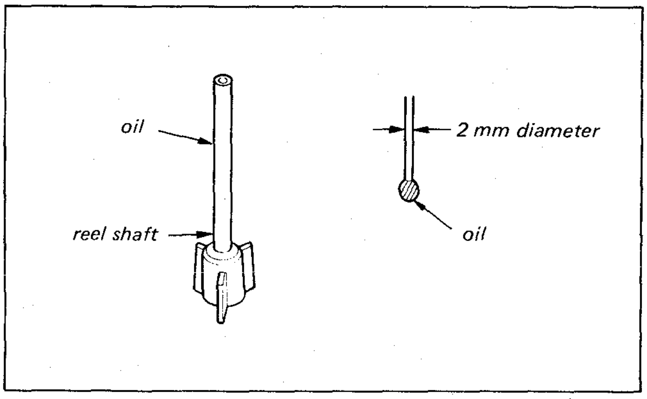
A part replacement must be done in the overhaul operation, referring to the listed items. The replacement periods of the motor and the head which are not included in the chart items are as follows.

Full erase head . . . . . . .about 4,000 operating hours
Capstan motor. . . . . . . .about 2,000 operating hours
Threading Motor . . . . . .about 2,000 operating hours
Reel Motor. . . . . .about 2,000 operating hours
Cassette Motor . . . . . . .about 2,000 operating hours

2-5 OTHERS

2-5-1. Lubricating Oil

- Be sure to use DTE oil (or equivalent) for lubrication. (Various troubles will be caused, if a different viscosity oil is used.)
- Use the oil without dust or other foreign matter for the bearing lubrication. (If an oil containing dust and others is used, wear and burning of the bearing are apt to occur.)
- The quantity of "a drop of oil" is aobut the quantity that will stick to the tip of a 2 mm diameter stick, as shown in the figure below.



SECTION 3

CHECK, ADJUSTMENT AND REPLACEMENT PROCEDURES

3-1. REPLACEMENT OF VIDEO HEAD ASSEMBLY AND ECCENTRICITY ADJUSTMENT

(1) Remove the video head disk assembly, taking Steps ② to ⑥ shown in Fig. 3-1.

Note:
- Never loosen two setscrews fastening the lower flange to the drum shaft.
- Never loosen lower two screws of the drum support.
- Prior to installing the video head disk assembly ⑥, clean surfaces Ⓐ and Ⓑ with a piece of cloth wetted with methanol or isopropyl alcohol.

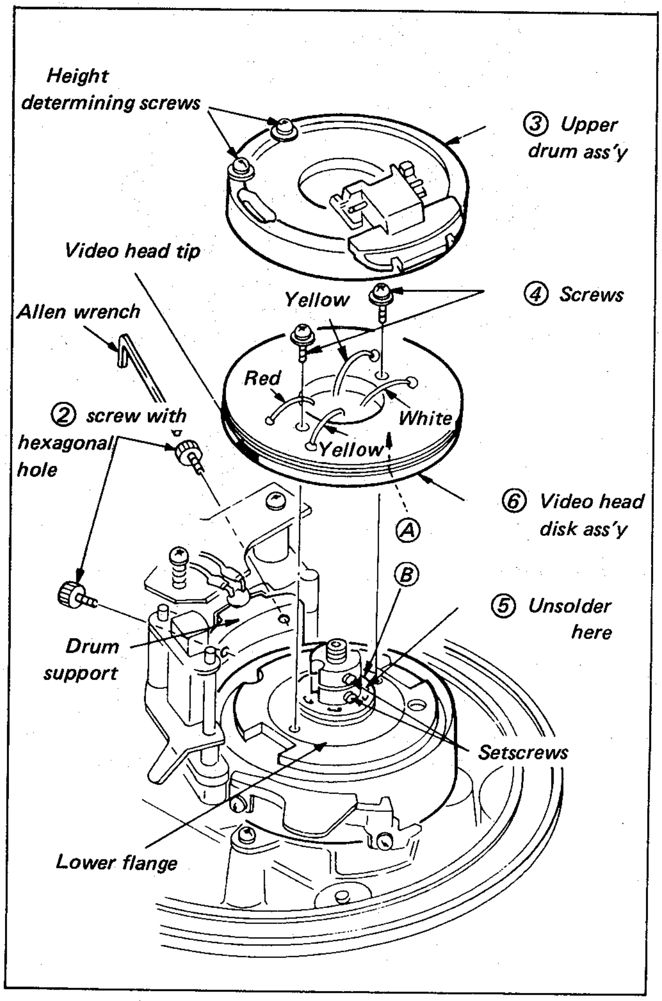

Height determining screws
③ Upper drum ass'y
Video head tip
Allen wrench
Yellow
④ Screws
Red
② screw with hexagonal hole
White
Yellow
⑥ Video head disk ass'y
Ⓐ
Ⓑ
⑤ Unsolder here
Drum support
Setscrews
Lower flange

Fig. 3-1. Replacement of Video Head Disk Assembly

(2) Install the video head disk assembly tentatively and perform eccentricity adjustment.

(i) Remove the video printed wiring board.

(ii) Install adjustment tools ①, ② and ③ as shown in Fig. 3-2.

(iii) After installing the adjustment tools in the correct position, turn the shaft in center of the drum slowly counterclockwise and lightly tap the periphery of the drum assembly ④ until the pointer of the eccentricity adjustment tool (J-3) must not deflect more than 3 microns, using a screwdriver or the like with a cloth wrapped around it.

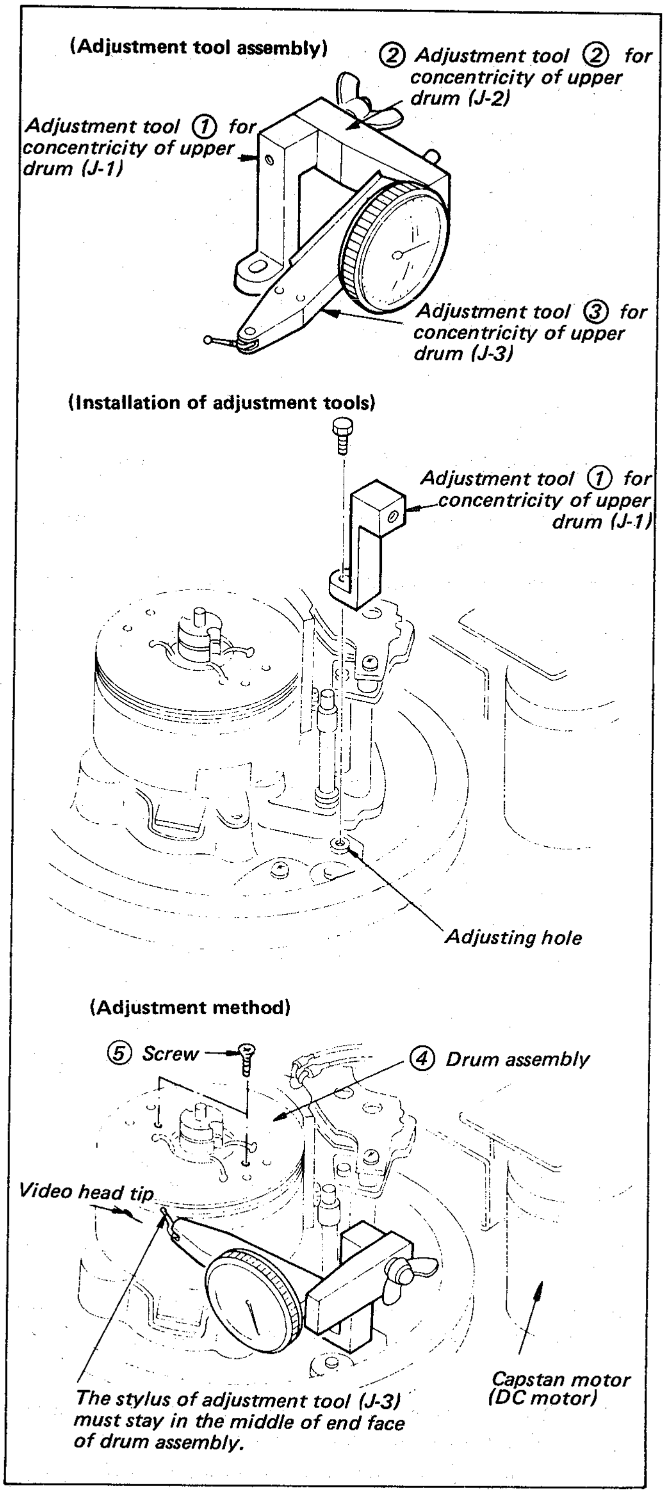

(Adjustment tool assembly)
② Adjustment tool ② for concentricity of upper drum (J-2)
Adjustment tool ① for concentricity of upper drum (J-1)
Adjustment tool ③ for concentricity of upper drum (J-3)
(Installation of adjustment tools)
Adjustment tool ① for concentricity of upper drum (J-1)
Adjusting hole
(Adjustment method)
⑤ Screw
④ Drum assembly
Video head tip
Capstan motor (DC motor)
The stylus of adjustment tool (J-3) must stay in the middle of end face of drum assembly.

Fig. 3-2. Eccentricity Adjustment of Video Head Disk Assembly

Note: When tapping the periphery of the drum assembly ④, do it carefully so as not to damage the video head tip.

(iv) After adjustment, gradually and alternately tigten the screws ⑤ securing the drum assembly ④. (Screw tightening torque: 10 kg.cm or more.)

(v) After tightening the two screws, make sure once again that the meter does not deflect more than 3 microns.

(vi) Solder each of four head leads and fix the upper drum assembly while you are holding two height determining screws as shown in Fig. 3-1.

(3) Perform the following adjustment after mounting the new video head disk assembly.

Tape path adjustment
ACE assembly position adjustment
Video head dihedral adjustment
7-3-1 (2) RF switching position adjustment
7-3-2 (3) REC mode servo lock phase adjustment
7-4-13 Playback amplifier frequency characteristic adjustment
7-4-10 Y-FM record current adjustment
7-4-11 Chroma record current adjustment

3-2. REPLACEMENT OF DRUM ASSEMBLY

(1) Put the machine upright on its left side. Remove the SYSCON board.

(2) Remove the drum shield ① shown in Fig. 3-3.

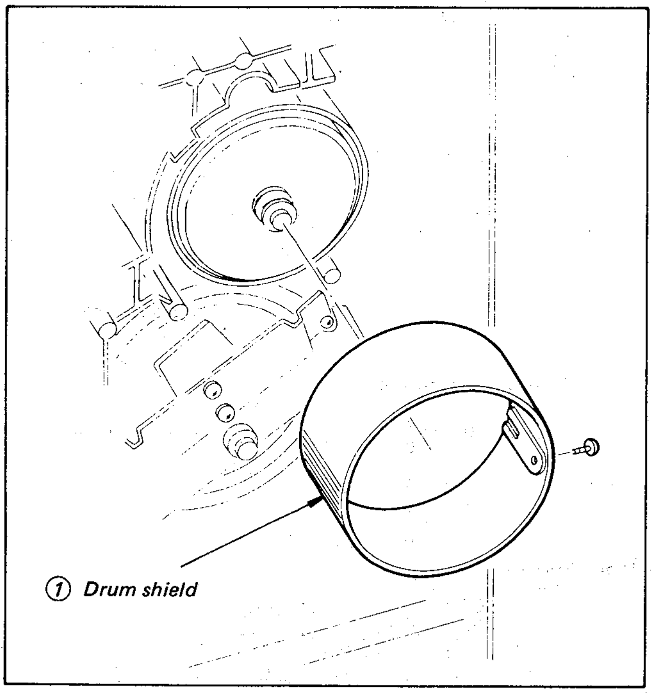


Fig. 3-3. Replacement of Drum Assembly (1)

(3) Remove two screws ①, connectors ②, ③, and ④. In this condition, the drum assembly can be removed.

(4) Insert an electrician's pliers, screwdriver, or the like in the hole of the rotor of the rotor assembly shown in Fig. 3-3 to secure the rotor assembly. Then pull out the rotor assembly by N5ϕ, SW5ϕ.

(5) Remove the screw shown in Fig. 3-5, and pull out the rotor assembly.

(6) Install the rotor assembly and the stator assembly removed in steps 4 and 5 above on the new drum assembly.

Note: When mounting the stator assembly, do so, making sure that 3P connector on the stator assembly fits into the slot of the shield assembly.

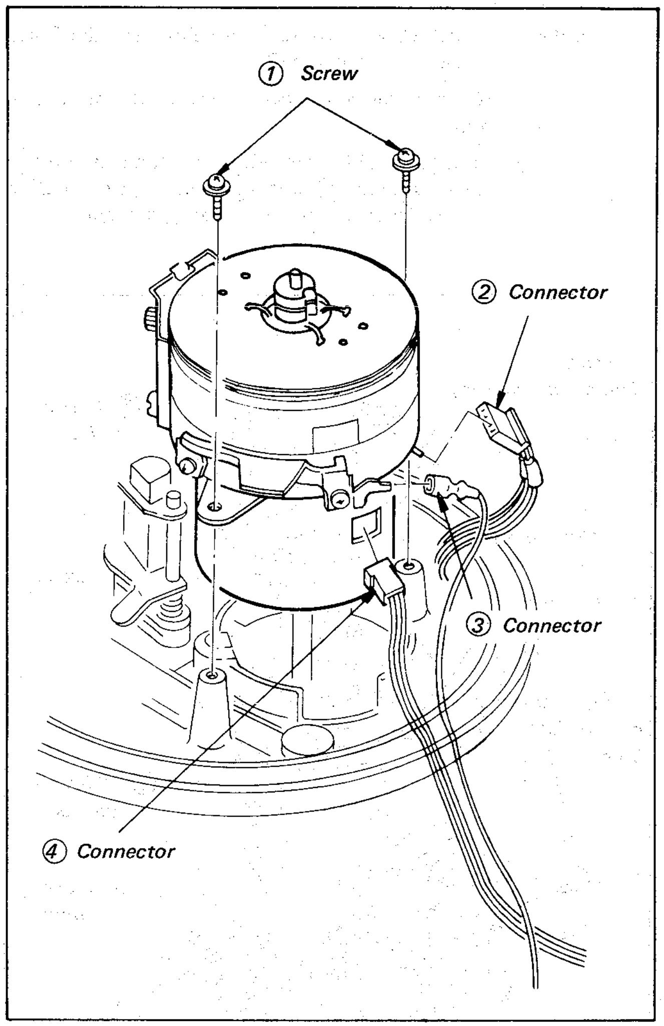


Fig. 3-4. Replacement of Drum Assembly (2)

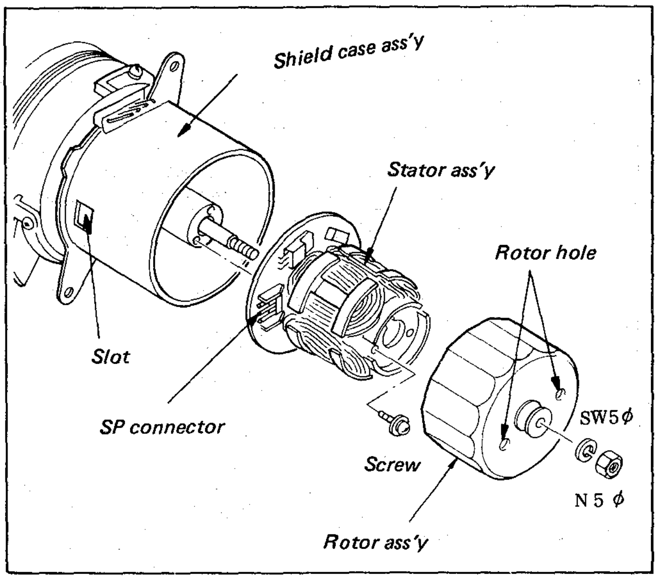

Shield case ass'y
Stator ass'y
Rotor hole
Slot
SP connector
SW5ϕ
Screw
N 5 ϕ
Rotor ass'y

Fig. 3-5. Replacement of Drum Assembly (3)

(7) Install two connectors and the drum shield assembly.

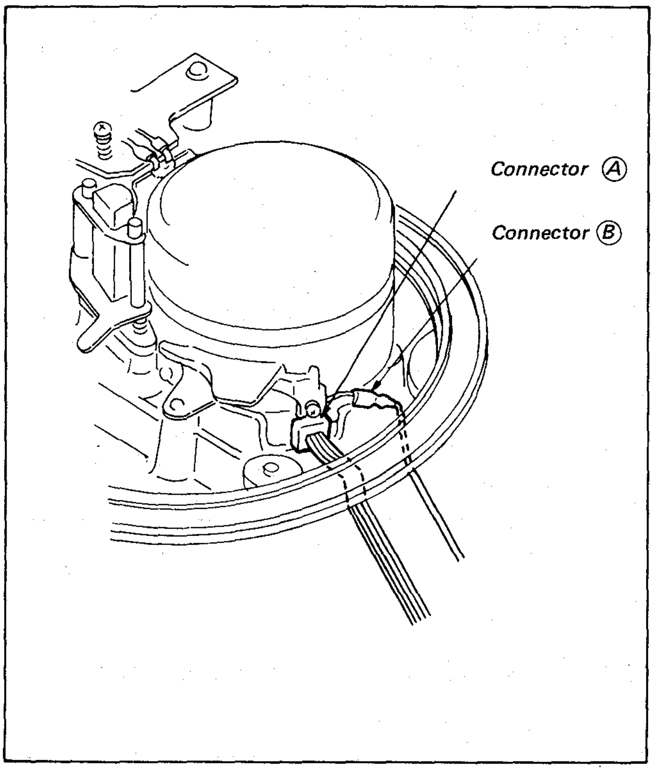

Connector Ⓐ
Connector Ⓑ

Fig. 3-6. Replacement of Drum Assembly (4)

(8) Perform the following adjustment after the replacement.

- Tape pass adjustment
- ACE assembly position adjustment

3-3. REPLACEMENT OF CAPSTAN DC MOTOR

(1) Stand the machine on its left side and remove the SYSCON printed wiring board.

(2) Remove the DC motor from the DC motor bracket, following steps 1 and 2 shown in Fig. 3-7.

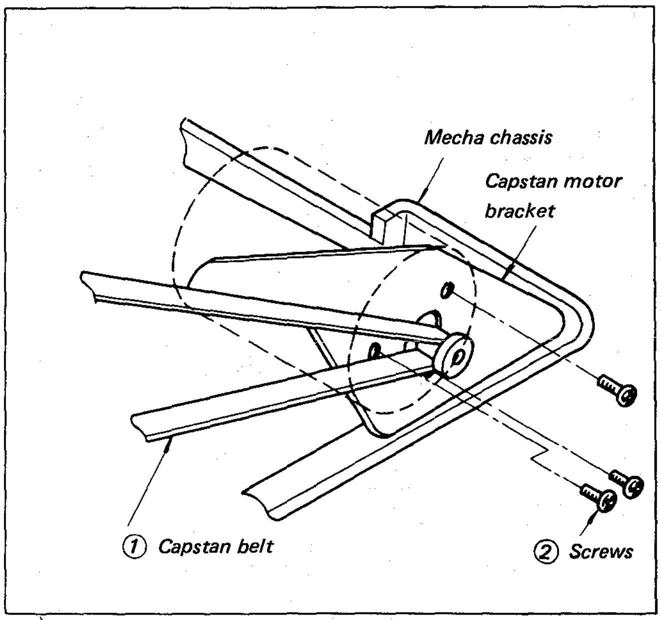

Mecha chassis
Capstan motor bracket
① Capstan belt
② Screws

Fig. 3-7. Replacement of DC Motor (1)

(3) Remove the capstan belt ① and capstan motor pulley ② from the defective DC motor and install these on the motor to be newly installed as shown in Fig. 3-8.

Note: When installing the capstan motor pulley ②, provide a gap of about 1.5 to 2 mm between it and the capstan motor ③.

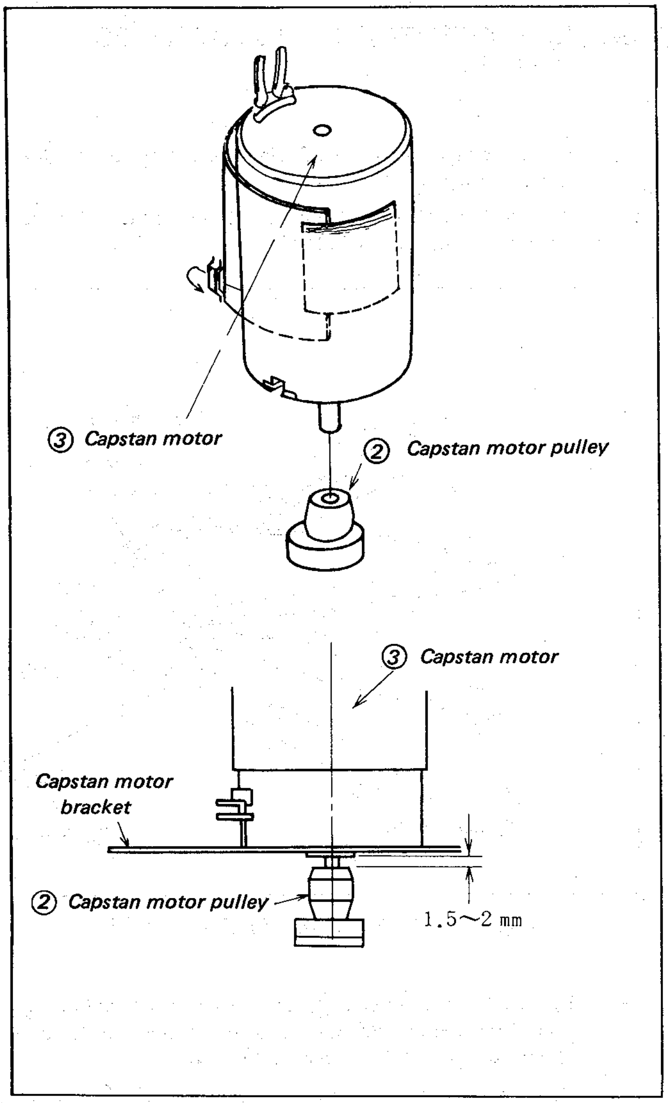

③ Capstan motor
② Capstan motor pulley
③ Capstan motor
Capstan motor bracket
② Capstan motor pulley
1.5~2 mm

Fig. 3-8. Replacement of DC Motor

(4) After replacement, make the following adjustment.
- Capstan free speed adjustment

3-4. REPLACEMENT AND ADJUSTMENT OF TENSION REGULATOR ARM PLATE ASSEMBLY AND TENSION REGULATOR BAND ASSEMBLY

The tension regulator arm replacement must be done carefully, following the procedure below, because the tape interchangeability is much affected by the tension regulator arm operation.

3-4-1. When Tension Regulator Band Assembly is Replaced

(1) The tension regulator band assembly can be removed after removing screw ① and hook ② shown in Fig. 3-9.

(2) Perform the tension regulator FWD position adjustment described below after the replacement.

  (i) Place the machine into the STOP mode without an inserted cassette.

  (ii) Set up the PLAY mode.

  (iii) Move the brake band in the direction of an arrow as shown in Fig. 3-9 and tighten the screw at the position where state shown in Ⓐ can be st up.

  (iv) Perform the FWD back tension adjustment after replacement.

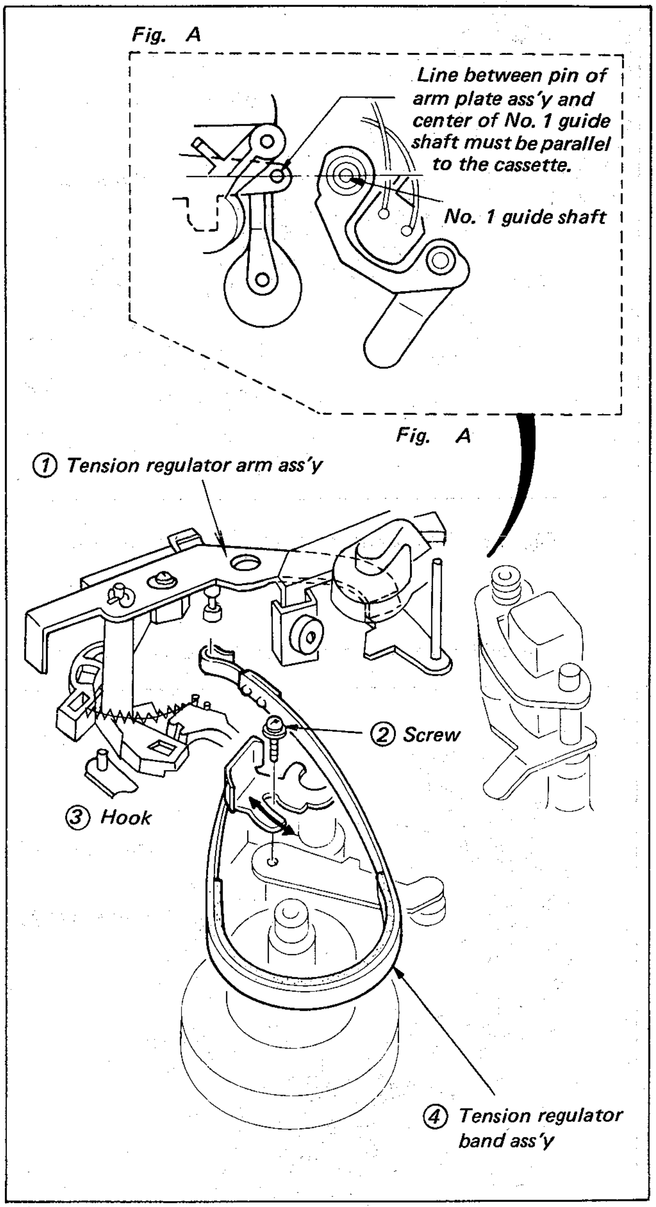


Fig. A
Line between pin of arm plate ass'y and center of No. 1 guide shaft must be parallel to the cassette.
No. 1 guide shaft
Fig. A
① Tension regulator arm ass'y
② Screw
③ Hook
④ Tension regulator band ass'y

Fig. 3-9.

3-4-2. When Tension Regulator Arm Plate is Replaced

(1) Set up the FWD mode.

(2) Loosen screw ③ securing the tension regulator band ass'y ④ shown in Fig. 3-10, move the ass'y in the direction of an arrow, and temporarily tighten the screw ③ at the position where the state of view Ⓒ is established.

(3) Insert a standard blade-tip screwdriver into section Ⓓ and adjust the clearance between the release link (1) assembly ⑥ and tension regulator arm assembly ⑦ until it is 0.5 to 1.0 mm, and also the clearance A is 0.1 to 3 mm. Then secure the section Dusing a screw ②.

(4) Tighten a screw ③ as stated in 3-4-1 above.

(5) After adjustment, make screw lock.

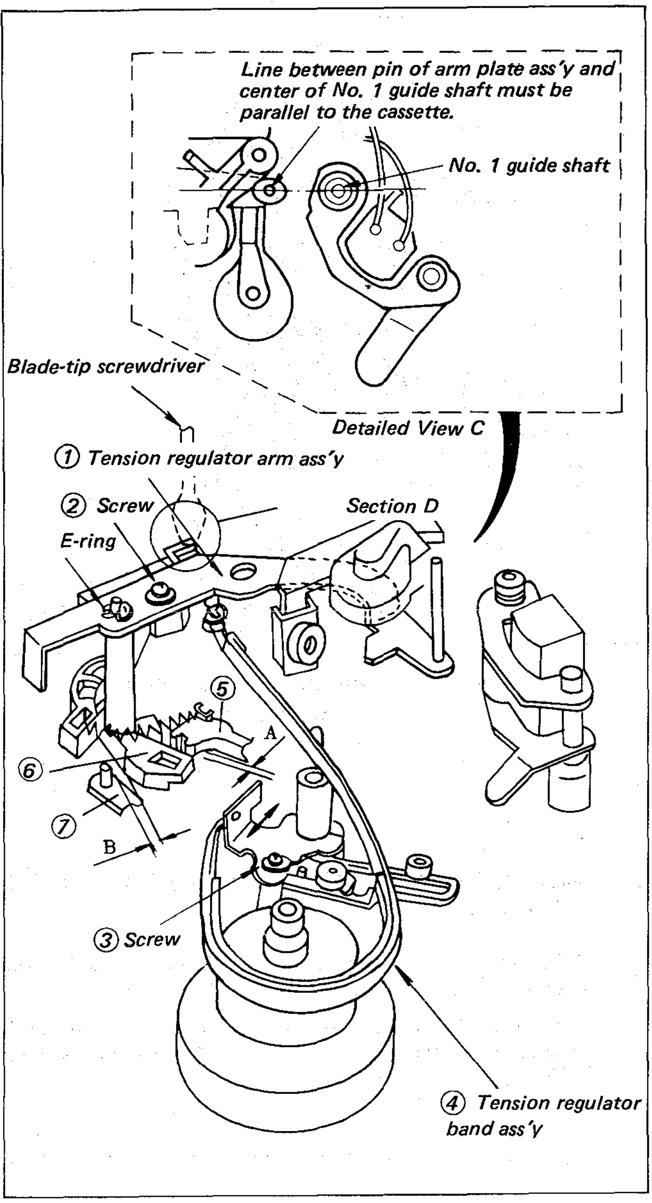

Line between pin of arm plate ass'y and center of No. 1 guide shaft must be parallel to the cassette.
No. 1 guide shaft
Blade-tip screwdriver
Detailed View C
① Tension regulator arm ass'y
② Screw
E-ring
Section D
⑤
A
⑥
⑦
B
③ Screw
④ Tension regulator band ass'y

Fig. 3-10.

(6) Play back the Monoscope segment of the alignment tape (KR5-2H). Loosen the lock screw and adjust screw "a" so that the RF waveform becomes flat (see the waveform in the tape path adjustment, Section 3-16-1) when the TRACKING knob is turned to the right and left from the flanges of guides ①, ②, and ③ shown in Fig. 3-11, and there is not a large tape curl at the guides.

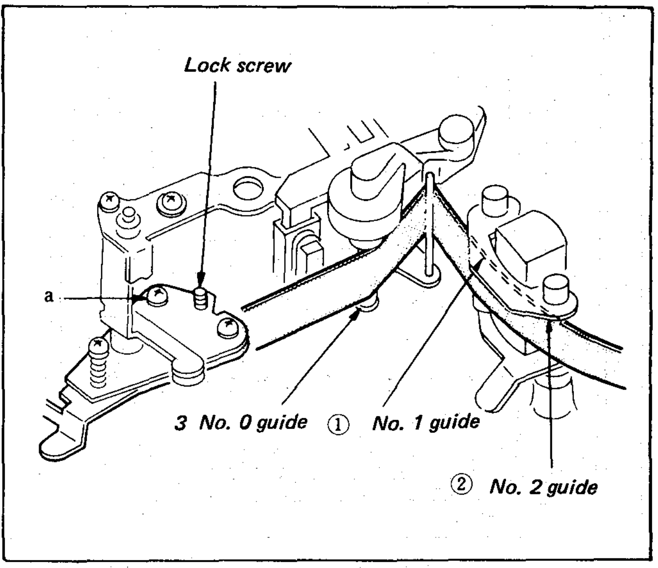

Lock screw
a
③ No. 0 guide
① No. 1 guide
② No. 2 guide

Fig. 3-11. Replacement and Adjustment of Tension Regulator Arm Plate Assembly (2)

(7) After adjustment, confirm that there is not a large bending of the tape at each of the tension regulator guide pin section and the No. 0 guide section shown in Fig. 3-12. If bending is found, repeat Step 3.

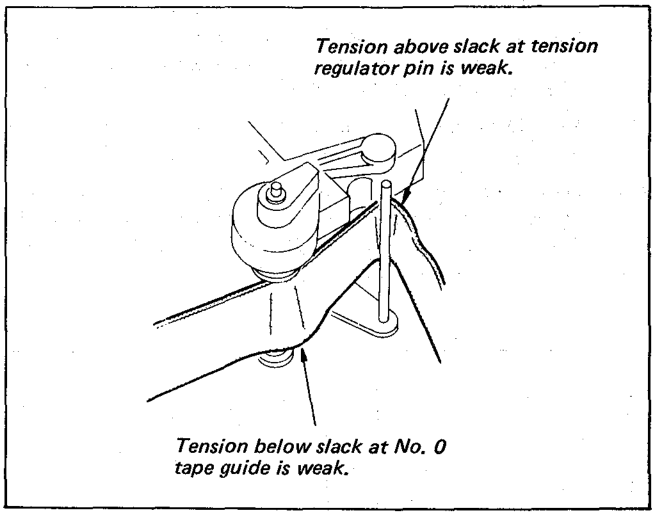

Tension above slack at tension regulator pin is weak.
Tension below slack at No. 0 tape guide is weak.

Fig. 3-12. Replacement and Adjustment (3) of Tension Regulator Arm Plate Assembly

3-5. REPLACEMENT OF CASSETTE-LIFT ASSEMBLY

(1) Set up the unthreading state and remove the cassette-lift assembly by loosening four screws and one connector.

(2) To install the cassette-lift assembly, do so by keeping taut the tension of the band brake shoe attached to the S tension regulator lever in the direction of an arrow shown.

Care should be taken to ensure that the band brake shoe is not caught in between the S reel table and the cassette-lift assembly.

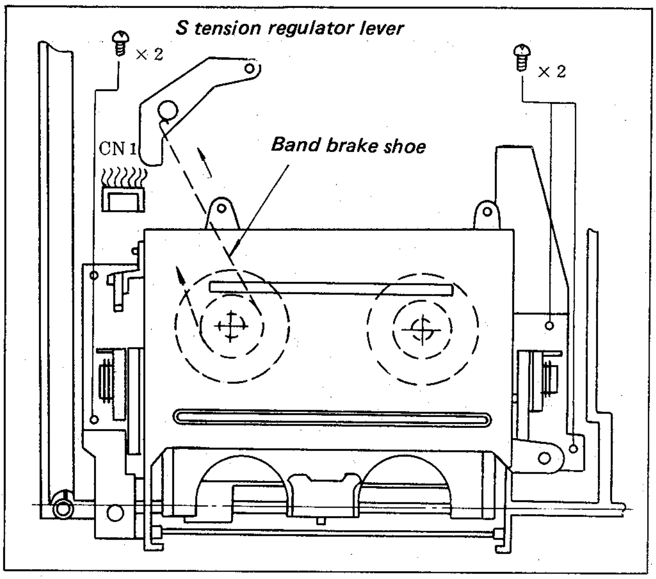

S tension regulator lever
× 2
× 2
CN 1
Band brake shoe

Fig. 3-13. Replacement of Cassette-Lift Assembly

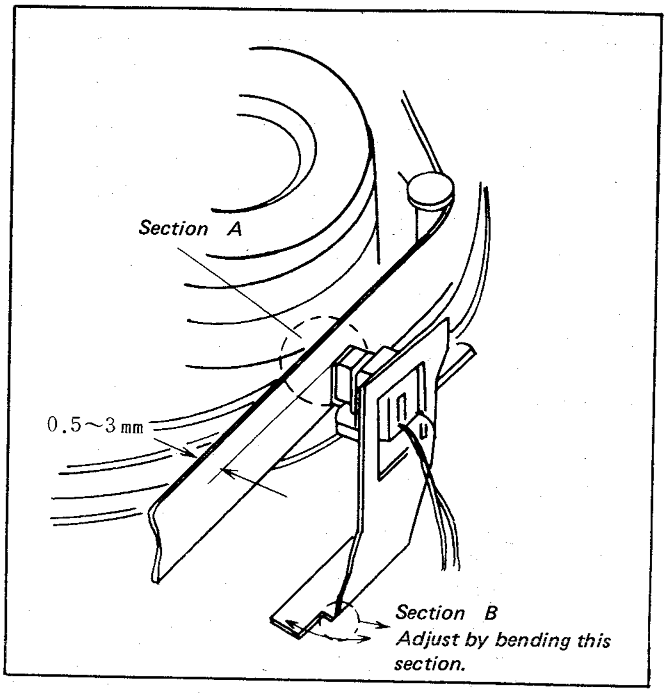

Section A
0.5~3 mm
Section B
Adjust by bending this section.

Fig. 3-15. Adjustment of Cassette Lift Bracket Position

3-6. ADJUSTMENT OF REEL TABLE HEIGHT

- Since the reed table height serves as the reference of the tape movement system, the height must be adjusted carefully after replacement of the reed table.

(1) Measure the height of the reel table with a slide caliper prior to the removal of the old reed table. (See Fig. 3-13)

(2) Place a new reel table, measure its height, and adjust height by adding or removing the adjusting spacer so that a difference in the height of the old reed table and the new reel table is within 0.1 mm. (See Fig. 3-14)

3-7. ADJUSTMENT OF CASSETTE LIFT BRACKET

(1) When the cassette lift bracket is not in position, adjust the section Ⓑ in the arrow direction, as shown.

(2) Next when the cassette is put into and placed into a playback state, confirm that the specification (0.5 to 3 mm) in section Ⓐ in the figure is met.

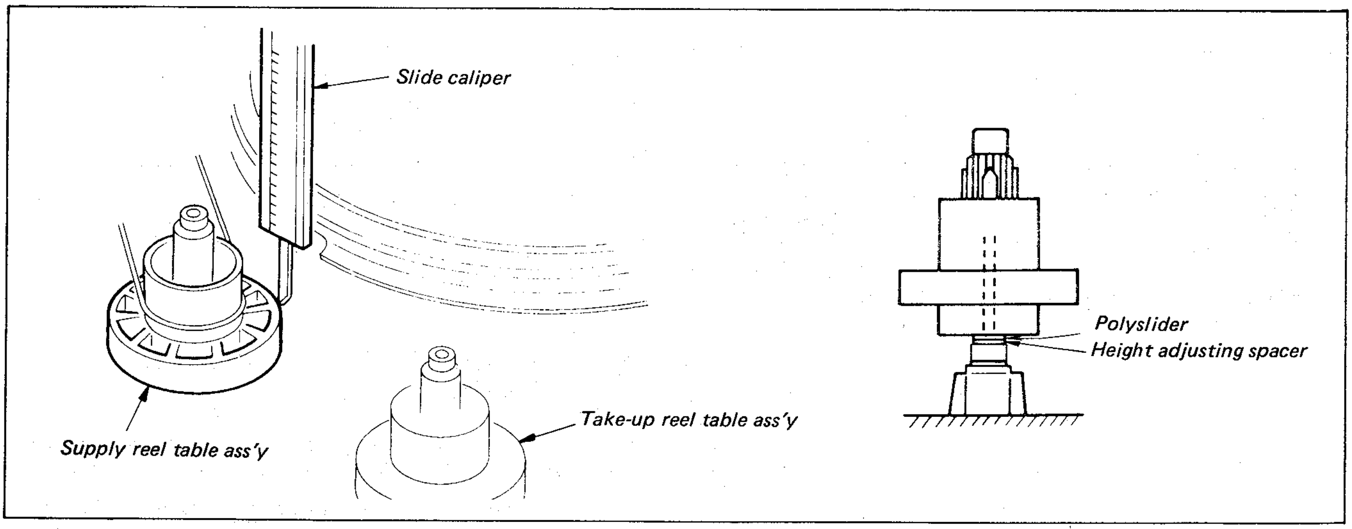

Slide caliper
Polyslider
Height adjusting spacer
Take-up reel table ass'y
Supply reel table ass'y

Fig. 3-14. Adjustment of Reel Table Height

3-8. REPLACEMENT AND ADJUSTMENT OF THREADING RING ASSEMBLY

(1) Turn the threading ring to a point immediately before the threading completion position by hand.

(2) Perform procedures ① to ③ shown in Fig. 3-16.

(3) Remove the threading ring while moving the tension regulator arm assembly in the arrow direction by holding its lower section.

Note: Do not hold the upper section of the tension regulator arm while moving the assembly.

(4) Perform the adjustment of No. 0 guide section assembly ② and ring rollwer unit assembly ③ after replacement.

- (i) Perform procedure ③ of this section.
- (ii) As to the adjustment of the roller unit assembly ③, perform adjustment, referring to detail view Ⓐ in Fig. 3-16.

(5) Perform the threading and unthreading several times and confirm the smooth movement of the threading ring.

(6) Adjustment after the mounting of No. 0 guide section assembly.

- (i) Play back the Monoscope segment of the alignment tape (KR5-2H).
- (ii) Turn the TRACKING control knob so that the RF waveform is 2/3 of its maximum level. (Sie Fig. 3-30)
- (iii) Turn the No. 0 guide shown in Fig. 3-30 counterclockwise (↺) and then clockwise (↻) until the point where the RF waveform at the exit section becomes flat with small fluctuations, and then tighten the mounting screws.

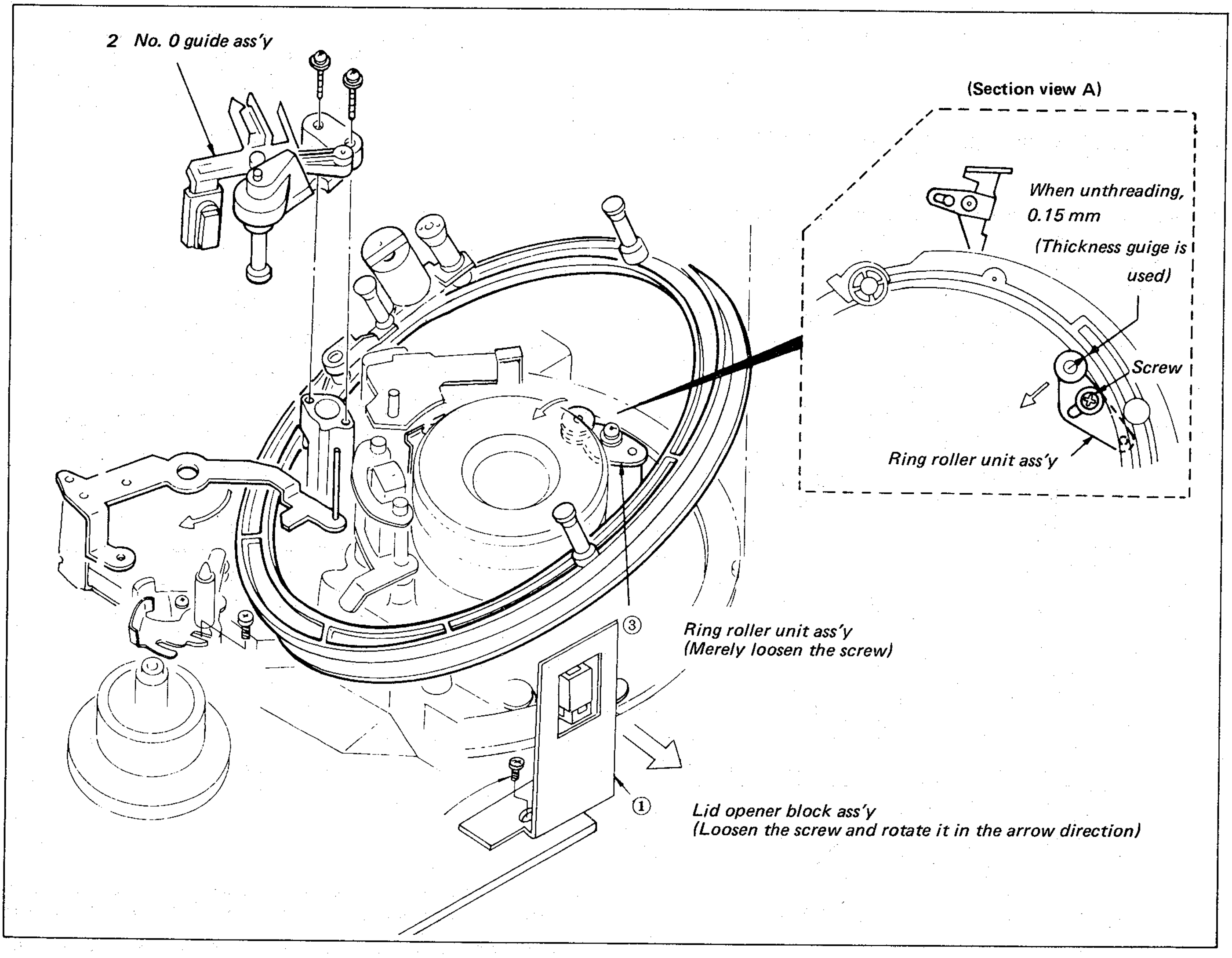

2 No. 0 guide ass'y
(Section view A)
When unthreading, 0.15 mm
(Thickness guige is used)
Screw
Ring roller unit ass'y
③
Ring roller unit ass'y
(Merely loosen the screw)
①
Lid opener block ass'y
(Loosen the screw and rotate it in the arrow direction)

Fig. 3-16. Replacement of Threading Ring Assembly

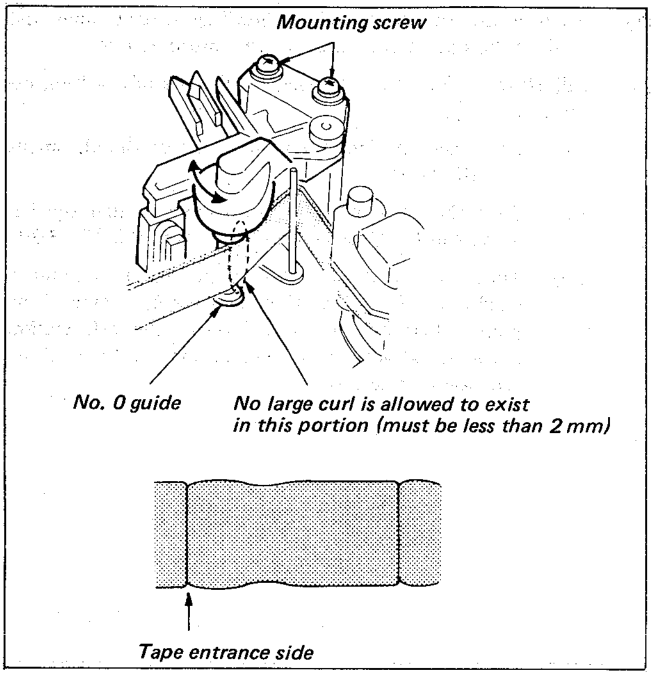

Mounting screw
No. 0 guide
No large curl is allowed to exist in this portion (must be less than 2 mm)
Tape entrance side

Fig. 3-17. Position Adjustment of No. 0 Guide Assembly Mounting

3-9. ADJUSTMENT OF PINCH ROLLER SOLENOID POSITION

(1) Loosen the mounting screw shown in Fig. 3-18 in the FWD mode and move the pinch solenoid base to the left and right, to satisfy the standard value A, after which screw lock should be made.

(2) Adjust the paralleling screw so that the pinch roller and the capstan shaft are visually held parallel in the FF/REW mode and then make screwlock.

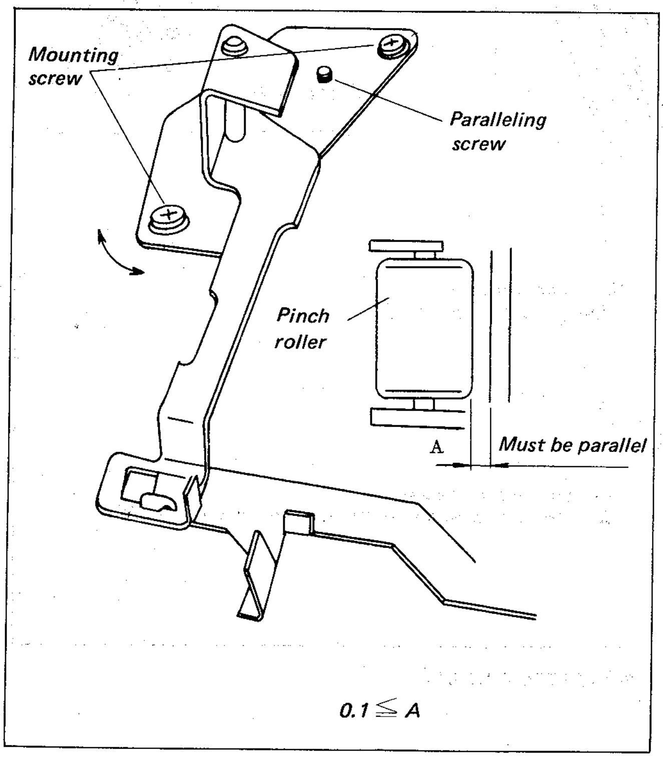
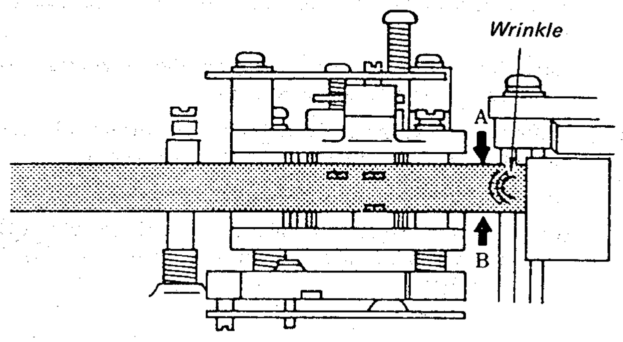

Mounting screw
Paralleling screw
Pinch roller
A
Must be parallel
0.1 ≦ A

Fig. 3-18.

(3) Tap the top and bottom of the table near the capstan entrance and confirm that the specification of Fig. 3-19 is satisfied.
If the specification is not satisfied, repeat the procedure 1 of Adjustment of Pinch Roller Solenoid Position in Section 3-9.



Specification: *$a - b < 5$ sec*
where
a ....time required to remove wrinkle when tapping is donw in direction of arrow A
b....time required to remove winkle when tapping is done in direction of arrow B.

Fig. 3-19.

3-10. CHECK OF THREADING COMPLETION

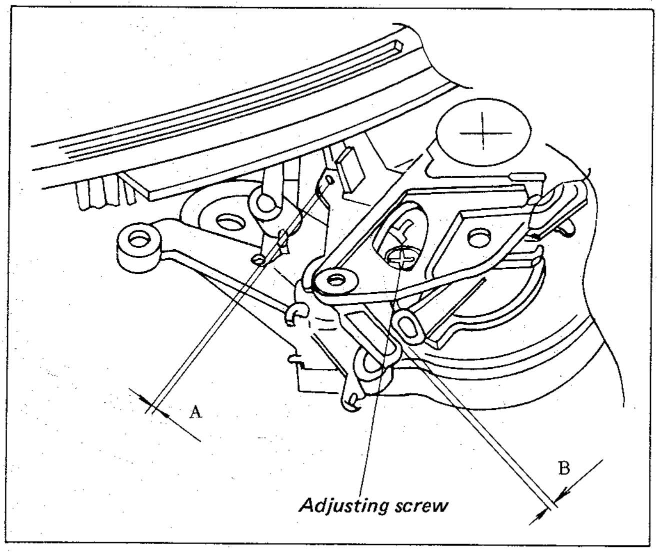

A
B
Adjusting screw

Fig. 3-20.

With the threading completed, there must not be a clearance A between the pin and the cam lock arm ②. (Must be in contact)

At that time, also there must not be a clearance B in between the cam lock arm ① and the base lock arm ②. (Must be in contact)
A, B = 0 (visual)

- Make a threading completion check.

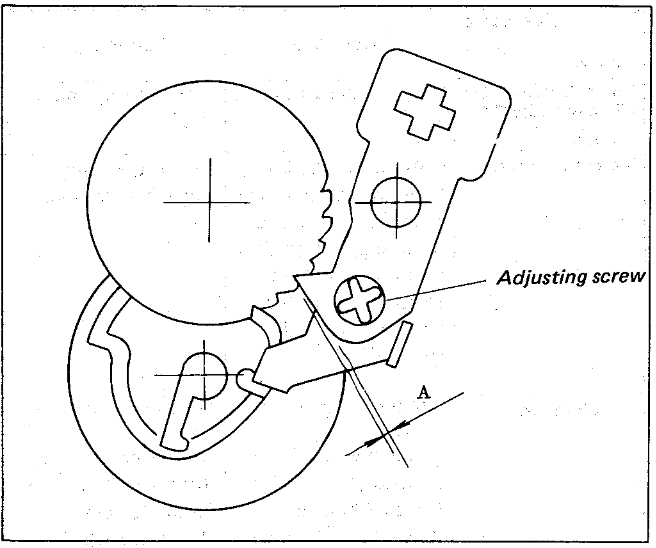


Fig. 3-21.

No gap is allowed to exist when in the FWD mode or the FF/REW mode. (Must be in contact)

A = 0 (visual)

Method of Adjustment	Remarks
1. In the FWD or FF/REW mode, the adjusting screw shown above is loosened and adjustment is then visually made to ensure that there is no clearance A.	**Note:** Do not screw lock.

3-11. CHECK OF TAKE-UP TORQUE

- Because sufficient take-up torque cannot be obtained at the end of the tape if the take-up torque is below the specified value, tape slackness is caused at the capstan shaft point and sometimes the slack sensor operates.
- The take-up torque tends to increase gradually due to aging.

(1) Rewind the tape a little and select the PLAY mode (for the playback of the end of the tape) after the auto-stop at the tape end in the FAST FWD mode. Confirm that the tape runs without any slackness at the capstan shaft area.
If there is tape slackness, perform the following adjustment.

(2) Remove function PWB.

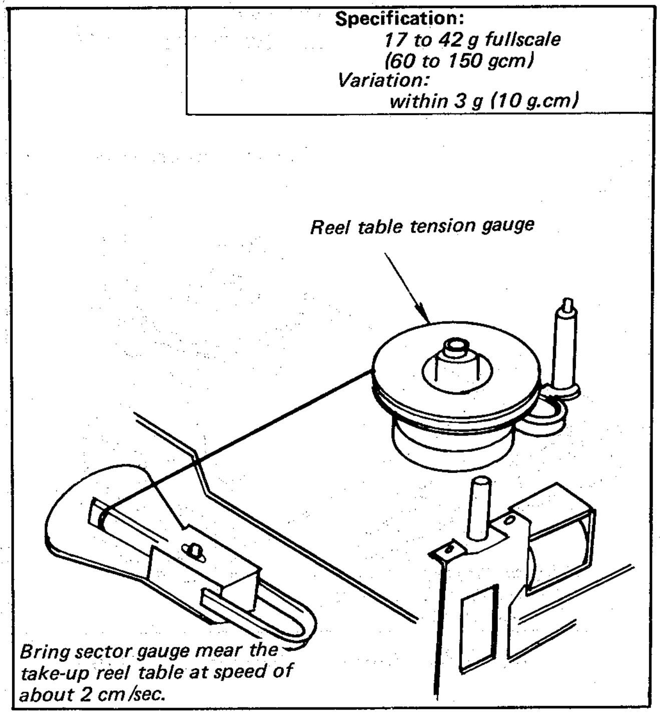
(3) Clean the take-up reel table assembly, the FWD idler assembly, and the FWD belt with a piece of cloth dampened with alcohol.

(4) Attach the reel table tension gauge on the take-up reel table as shown in Fig. 3-21.

(5) Pull out the string from the reel table tension gauge about 30 cm (12 inches) and hook the sector type tension gauge (50 g fullscale) on the end of string.

(6) Set up the PLAY mode.

(7) Bring the sector type gauge toward the tape-up reel table at a speed of approximately 2 cm/sec (8 inches/sec) as shown in Fig. 3-22. Confirm that the gauge reading is within the specification.
If not, adjustment should be made with the torque volume (VR-3) on the SYSCON printed wiring board.


Specification:
17 to 42 g fullscale
(60 to 150 gcm)
Variation:
within 3 g (10 g.cm)

Reel table tension gauge
Bring sector gauge mear the take-up reel table at speed of about 2 cm/sec.

Fig. 3-22. Check of Take-up Torque

3-12. CHECK OF CASSETTE EJECT TORQUE

- The tape is taken up by the take-up reel table in the cassette EJECT mode. The take-up reel table is driven via the belt by the DC motor, while the threading ring unthreads.
- If the cassette eject torque is below the specification, only the threading ring performs the unthreading operation while the tape is not pulled back into the cassette, and the tape can be damaged.

(1) Disconnect the belt from the threading motor SA.

(2) Attach the reel table tension gauge as shown in Fig. 3-23.

(3) Pull out the string of the gauge about 30 cm (12 inches) and hook the sector type gauge (50 g fullscale) on the end of the string.

(4) Set up the EJECT mode.

(5) As shown in Fig. 3-23, bring the sector type gauge speed of approximately 2 cm/sec. and make sure that the reading of the gauge is within a range of 300 to 400 g.
When necessary, adjust the torque using the torque adjusting volume (VR-4) on the SYSCON printed wiring board.

Specification:
14 to 71 g
(50 to 250 gcm)
Variation:
within 3 g (10 g.cm)

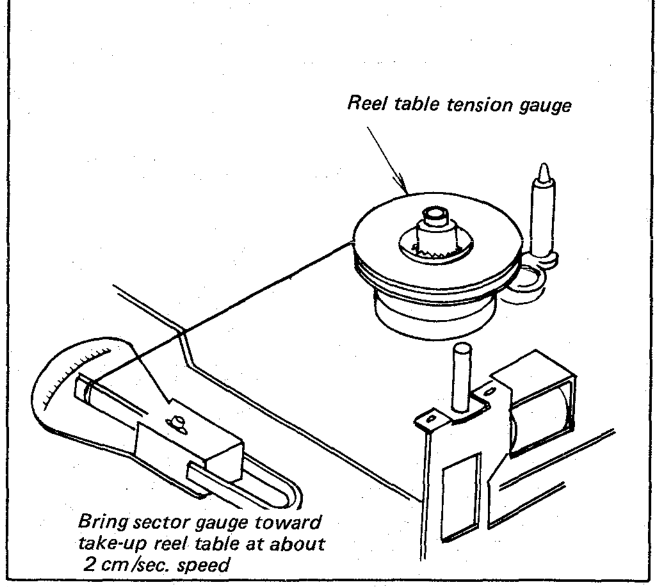

Reel table tension gauge
Bring sector gauge toward take-up reel table at about 2 cm/sec. speed

Fig. 3-23. Check of Cassette Eject Torque

3-13. CHECK OF BRAKE TORQUE

- Brakes operate as below.

Reel table ass'y / Mode	Supply Side	Take-up Side
When Cassette Up (Cassette EJECT Mode)	Supply and soft brakes are ON.	Only take-up brake is ON.
Threading mode	Only soft brake is ON. (It is normal that the supply reel rotates a little, supplying tape.) Soft brake torque: 15 to 30 g.cm. Reel table rotational direction is CW (↷).	Free (tape is supplied from take-up side.)
STOP mode	Supply and soft brakes are ON. Reel table rotational direction CW (↷): 100 to 500 g.cm Reel table rotational direction CCW (↶): 40 to 130 g.cm	Only main brake is On. Reel table rotational direction CW (↷): 20 to 60 g.cm Reel table rotational direction CCW (↶): 60 to 500 g.cm
FF mode	Only soft brake is ON.	Free (Tape is taken up to take-up side.)
REW mode	Only soft brake is ON. (Tape is taken up to supply reel side.)	Free.
PLAY mode	Only FWD back tension brake band is ON.	Free (Tape is taken up to take-up side.)
REC PAUSE mode	Tension regulator band for supply brake, soft brake, and back tension is ON.	Take-up brake is ON.
Unthreading mode	Soft brake ON (threading brake ON)	Free (Tape is taken to take-up side.)

3-13-1. Check of Main Brake Operation

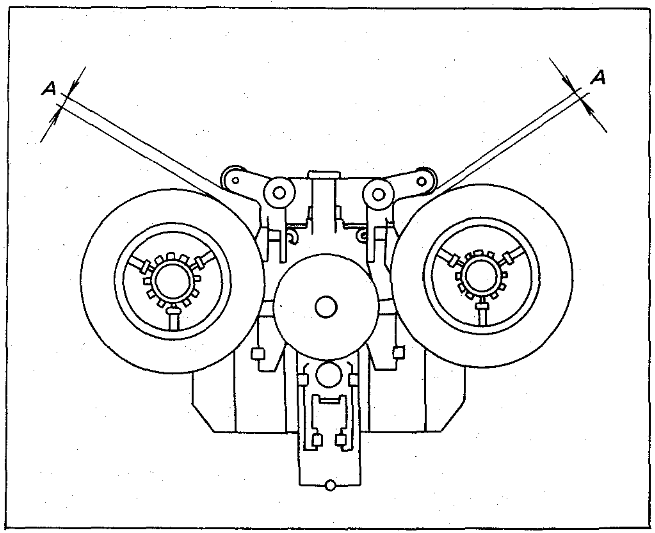


Fig. 3-24.

When the FWD mode and the FF/REW mode are selected, it should be confirmed that a clearance A between the reel table and the tension regulator arm is more than 0.5 mm.

Specification: A 0.5

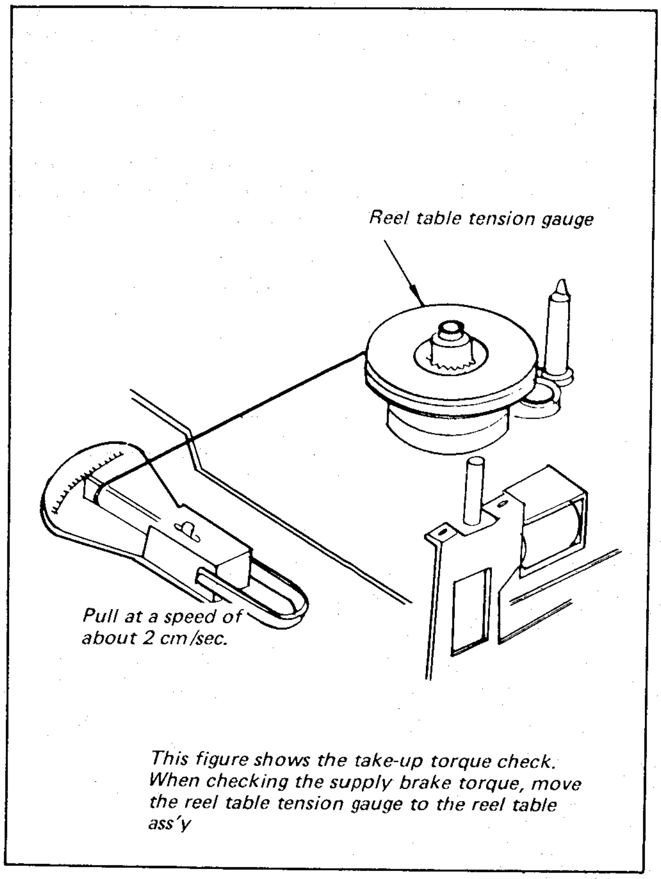
Confirm that a clearance A between the reel table and the brake arm is more than 0.5 mm during the mode of threading and unthreading.

Specification: A 0.5

3-13-2. Check of Supply Brake and Take-up Brake Torque

(1) Set up the STOP mode without the cassette. (See Fig. 2-2)

(2) Attach the reel table tension gauge to the take-up reel table as shown in Fig. 3-25 and hook the sector type gauge (100 g fullscale) to the end of the string. Pull the sector type gauge at a speed of about 2 cm/sec and observe the gauge reading.



This figure shows the take-up torque check. When checking the supply brake torque, move the reel table tension gauge to the reel table ass'y

Fig. 3-25. Check of Supply and Take-up Brake Torque

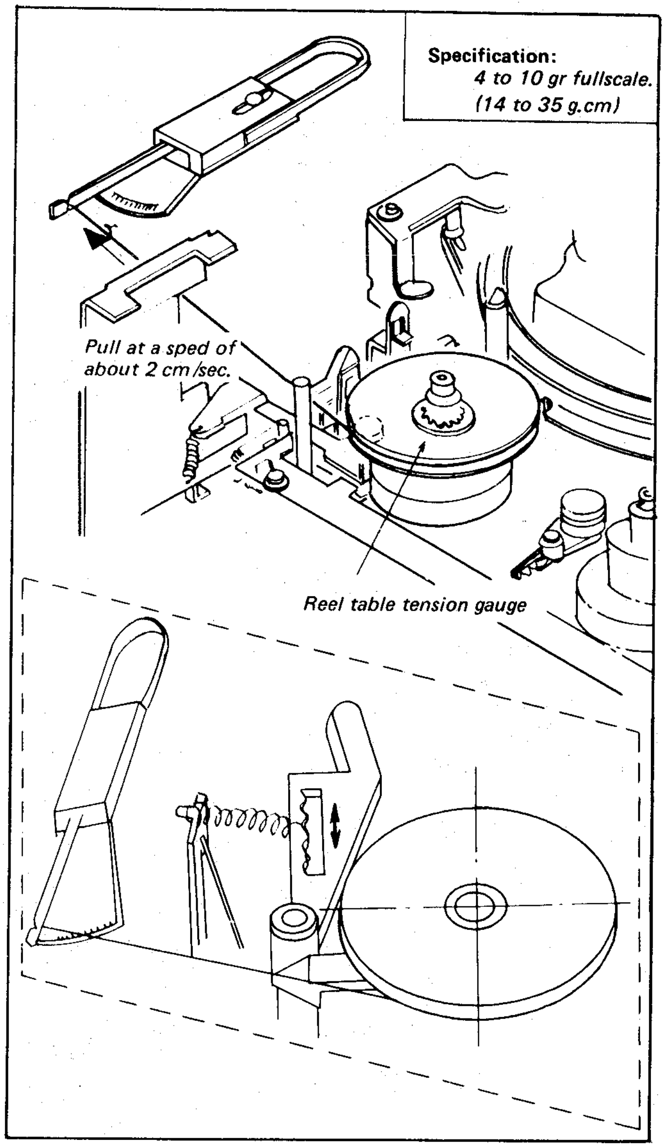
Specifications:

- When supply reel table ass'y rotates CW (↷):
  52 to 1050 g.cm (Scale value is 15 to 200 g)
- When supply reel table ass'y rotates CCW (↶):
  35 to 300 g.cm (Scale value is 10 to 100 g)
- When take-up reel table ass'y rotates CW (↷):
  35 to 350 g.cm (Scale value is 10 to 100 g)
- When take-up reel table ass'y rotates CCW (↶):
  52 to 1050 g.cm (Scale value is 15 to 300 g)

3-13-3. Check and Adjustment of Soft Brake Torque

(1) Mount the reel table tension gauge on the supply reel table as shown in Fig. 3-26 and hook the sector type gauge (50 g fullscale) to the end of the string of the tension gauge.

(2) Set up the FF mode. Then pull away the sector type gauge at a speed of about 2 cm/sec. and check that the gauge reading is as specified.
If the specification is not met, the spring tension should be adjusted by moving the position of spring hook in the direction of an arrow.



Specification:
4 to 10 gr fullscale.
(14 to 35 g.cm)

Fig. 3-26.

3-14. REEL TABLE TAKE-UP TORQUE

Take-up torque in the picture search mode.

(1) CUE mode
Mount the reel table tension gauge (66 mm dia.) on the take-up reel table as shown in Fig. 3-27, hook a rod type tension gauge (200 g fullscale) to the tip-end of the gauge,

and press the CUE button to check the reading when the tape is taken up at a speed of about 2 cm/sec.

Specification: 230 gr
(800g.cm)

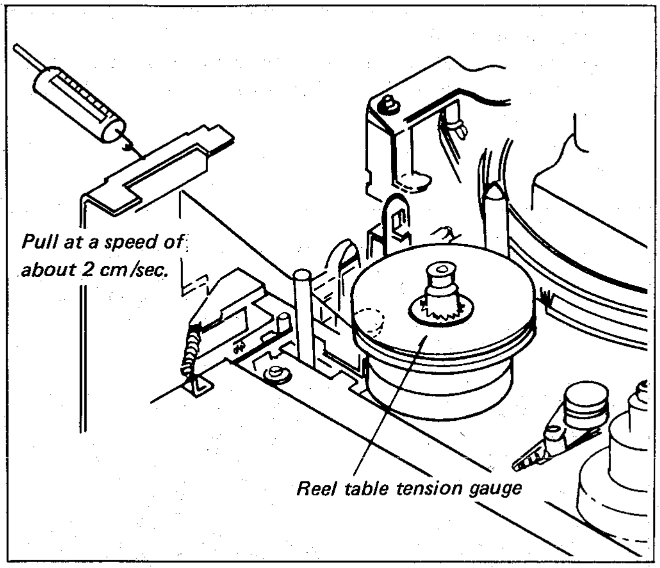


Fig. 3-27. Reel Table Take-up Torque

(2) In REVIE mode
Mount the reel table tension gauge on the supply reel table and make much the same measurement as (1) above.

Specification: 230 g
(800 g.cm)

When the measured result is not within the specification, make adjustment using SERVO/AUDIO printed board VR11. (Common to Cue and Review) (PWV-421)

3-15. ADJUSTMENT OF FWD BACK TENSION

- The ideal measurement of FWD back tension is to measure it under the same condition as during the actual tape running state. The simple measurement procedure of the FWD back tension is described here. The measurement error due to the different measurement procedure is corrected in the specification.

(1) Set up the STOP mode without the cassette. (Refer to Section 2-2)

(2) Place the FWD back tension jig on the supply reel table assembly and thread the tape as shown in Fig. 3-28. Hook the sector type gauge (100 g fullscale) to the end of the tape.

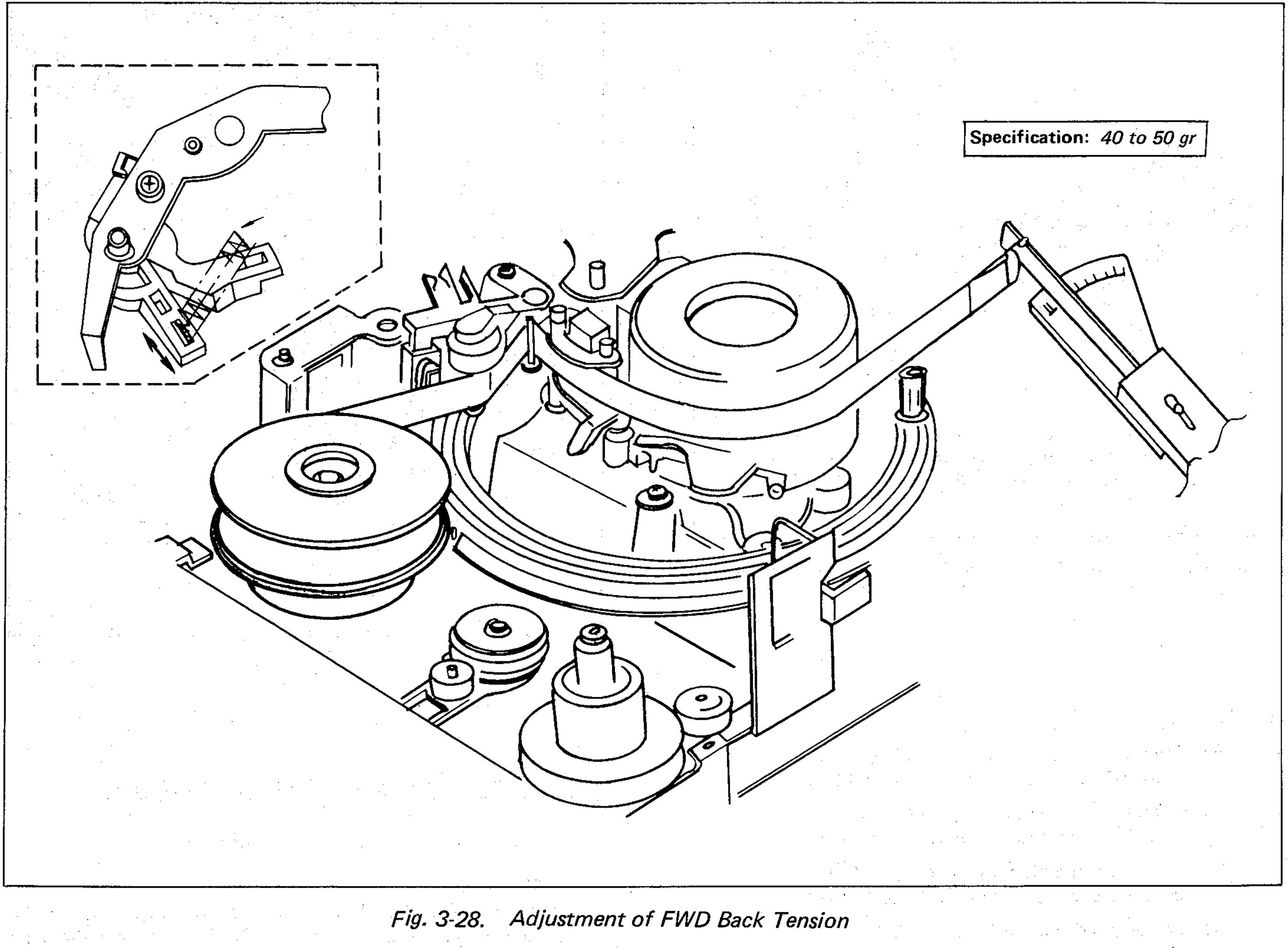


Fig. 3-28. Adjustment of FWD Back Tension

(3) Set up the PLAY mode.

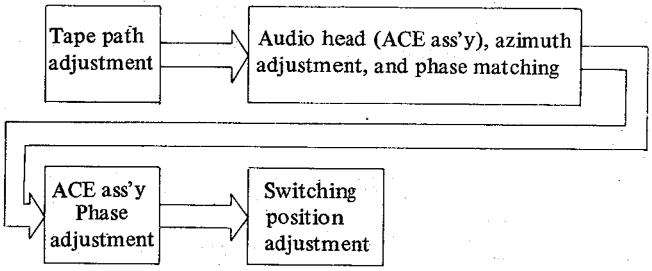
(4) Pull the sector type gauge at a speed of approximately 2 cm/sec and confirm that the gauge reading is within the specification. If not, perform Step 5.

(5) Adjust the spring hook position of the BT spring by moving it in the direction of an arrow.

(6) Repeat Steps 3, 4, and 5.

3-16. ADJUSTMENT OF TRACKING

- To make trackin; adjustment, proceed as follows:


Tape path adjustment
Audio head (ACE ass'y), azimuth adjustment, and phase matching
ACE ass'y Phase adjustment
Switching position adjustment

[Preparation]

(1) Fixtures and Tools Reauired:
Alignment tape (KR5-2H)
Dual trace oscilloscope
Inspection mirror
Alcohol
Chamois
3 mm flat tip screwdriver

(2) Oscilloscope Connection
RF envelope waveform : Video PWB TP-5
Switching waveform
External trigger : Video PWB TP-24
Audio out
Video out

(3) Location of Tape Guides

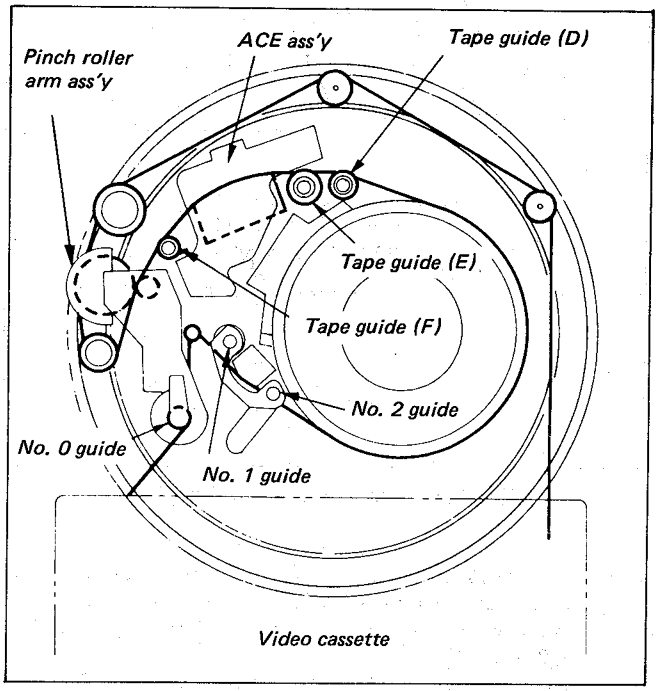

Pinch roller arm ass'y
ACE ass'y
Tape guide (D)
Tape guide (E)
Tape guide (F)
No. 2 guide
No. 0 guide
No. 1 guide
Video cassette

Fig. 3-29. Location of Tape Guide

3-16-1. Adjustment of Tape Path

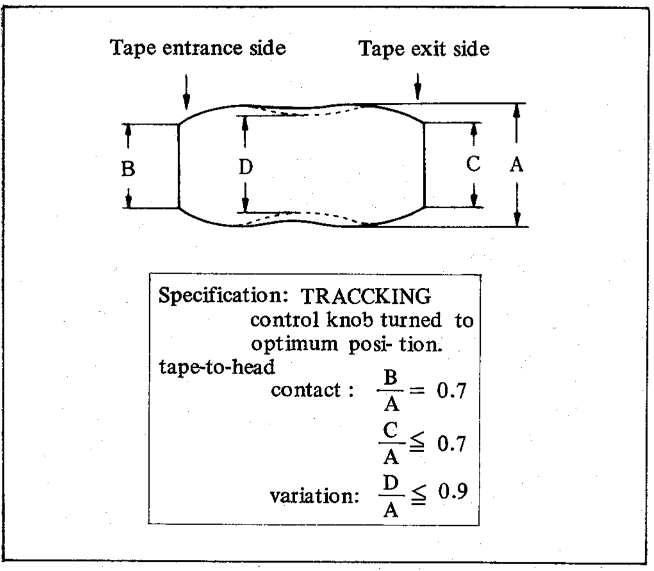
- This adjustment may largely affect the interchangeability of tape and image quality. So, the utmost care should be taken.

(1) Clean the tape running surfaced (tape guide, drum, capstan, and pinch roller) using a clothing cloth wetted with alcohol.

(2) Connect the oscilloscope to the video PWB, TP-5, and the external trigger to TP-24.

(3) Select the PLAY mode for the monoscope section of the alignment tape (KR5-2H).

(4) Confirm that the RF output waveform envelope on the oscilloscope screen increases and decreases, while remaining flat, when the TRACKING control knob is turned to the left and the right from its center detent position.
If the RF waveform does not increase or decrease while remaining flat, follow Step 6 for necessary adjustment.


Tape entrance side
Tape exit side
B
D
C
A

Specification: TRACCKING control knob turned to optimum position.

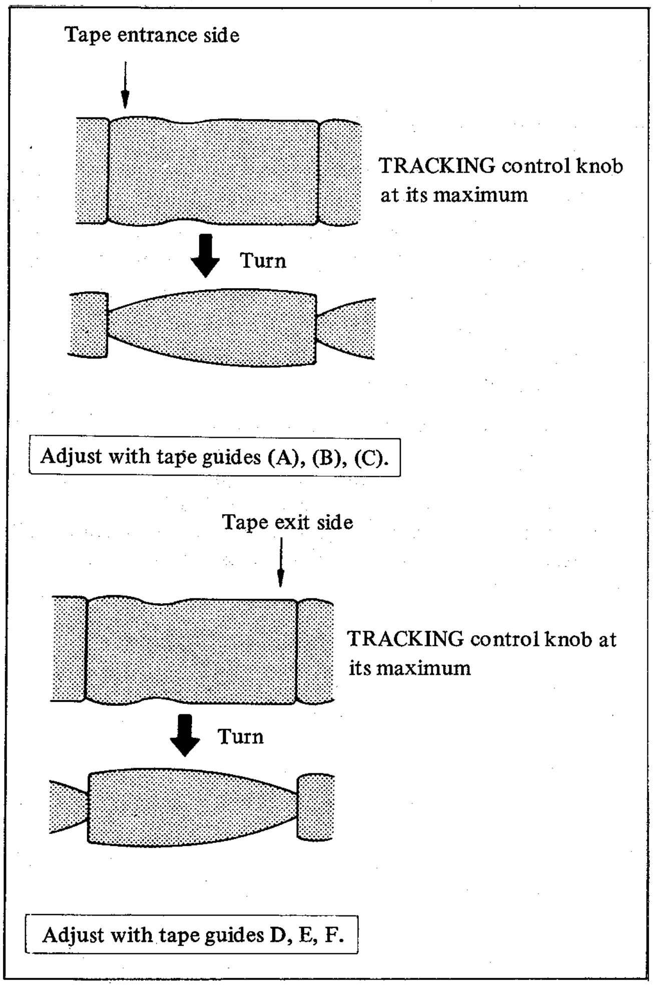
tape-to-head contact : $\frac{B}{A} = 0.7$

$\frac{C}{A} \leq 0.7$

variation: $\frac{D}{A} \leq 0.9$

Fig. 3-30. Adjustment of Tape Path

(5) Turn the TRACKING control knob to set it at the maximum RF output waveform. Confirm that the RF output waveform variations and contact meet the specification given in Fig. 3-30 at that time.
If these do not meet the specification, adjust by following Step 6.


Tape entrance side
TRACKING control knob at its maximum
Turn
Tape exit side
TRACKING control knob at its maximum
Turn

Adjust with tape guides (A), (B), (C).

Adjust with tape guides D, E, F.

Fig. 3-31. Adjustment of Tape Path

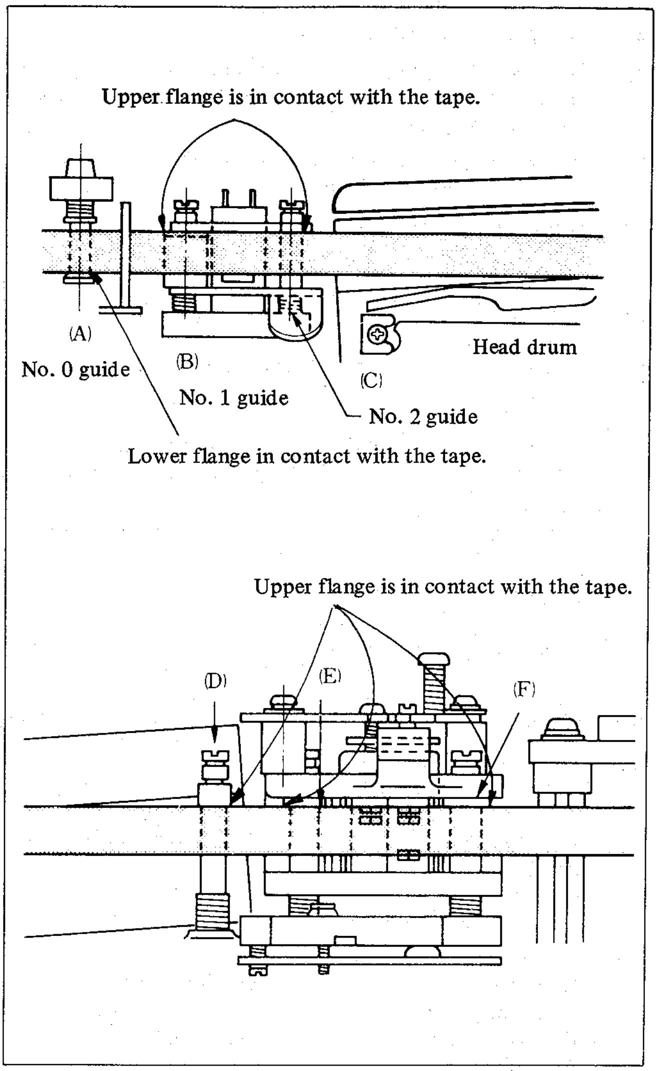

Upper flange is in contact with the tape.
(A)
No. 0 guide
(B)
No. 1 guide
(C)
No. 2 guide
Head drum
Lower flange in contact with the tape.
Upper flange is in contact with the tape.
(D)
(E)
(F)

Fig. 3-32. Adjustment of Tape Path

When the waveform at the entrance side is not flat as shown in Fig. 3-32 for the clockwise and counterclockwise turning of the TRACKING control knob from center, detent position, adjust the heights (A), (B), and (C) of tape guides (0), (1) and (2). When the waveform at the tape exit side is not flat, adjust the height of the tape guides (D), (E) and (F). The height adjustment must be performed so that the tape contacts with the drum heads, and there is a minimum curl (not more than 2 mm) at the flange of each tape guide, the upper or lower flange contacts with the tape as shown in Fig. 3-32, and the RF waveform is flat.
The construction of the ACE assembly enables the assembly to be adjusted so that its top plate is perpendicular to the fact of the moving tape as a whole, but this "tilt" adjustment is not necessary except after ACE assembly replacement. Since tape guide (D) regulates the movement of the tape around the drum exit, raise tape guide (D) about 0.5 mm before adjustment of the tape path on the exit side. Then lower tape guide (D) to the point immediately before the RF waveform varies, and with less than 2 mm curl after tape path adjustment.

3-16-2. Adjustment of Exit Side Tracking After ACE Assembly Replacement

(1) The ACE assembly can be removed if three screws shown in Fig. 3-33 are removed.

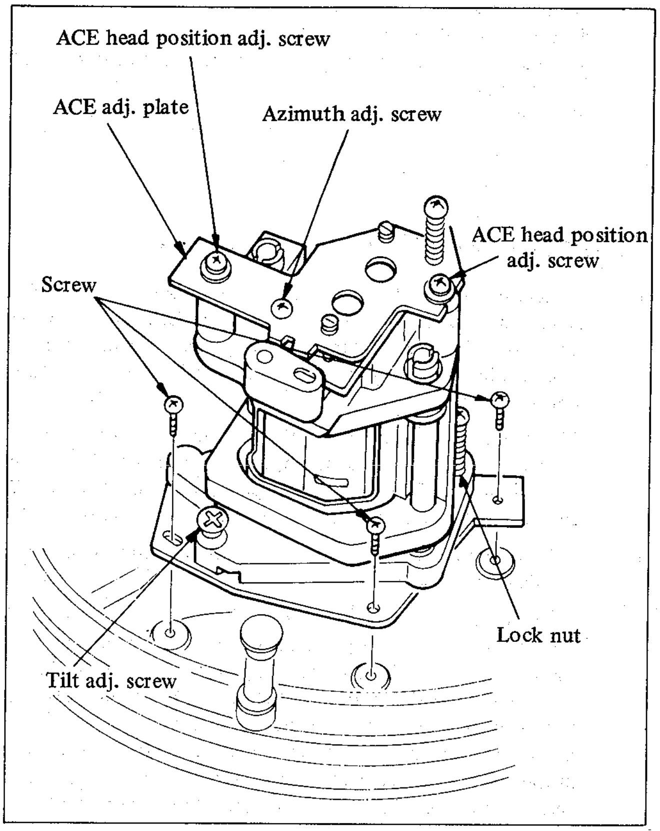

ACE head position adj. screw
ACE adj. plate
Azimuth adj. screw
ACE head position adj. screw
Screw
Lock nut
Tilt adj. screw

Fig. 3-33. Removal of ACE Assembly

(2) Perform the adjustment, following Step 3 onward after replacement.

(3) Raise the tape guide (D) shown in Fig. 3-32 by 0.5 mm. (Move the nut one turn)

(4) Play back the 1 MHz segment of the alignment tape (KR5-2H). Confirm that the RF wave output (see Fig. 3-30) satisfies the specification and there is a minimum curl (not more than 2 mm) on the tape edge contacting the tape guide. Confirm that the RF waveform varied from the flat state when the tape guides (E) and (F) are raised, and adjust the heights of the tape guides so that the waveform output becomes flat.

(5) When the waveform does not vary if the tape guides (E) and (F) are raised in Step 4 or when the waveform does not become flat if the tape guides are lowered, perform the adjustment, following the procedure below.

- (i) Loosen the lock nut shown in Fig. 3-33.
- (ii) Turn the zenith adjusting screw counterclockwise (↶) a little more than 30 degrees and turn it clockwise (↷) until the screw returns to the point 30 degrees counterclockwise from its original point.
- (iii) Perform Step 4 again. If the specification is not satisfied, perform Step 5 again. Since the ACE assembly was adjusted perpendicularly when assembled at the factory, do not turn the zenith adjustment screw more than 60 degrees to the right and left from the original position.
- (iv) After the adjustment, tighten the lock nut until a slight resistance for the tightening is left and confirm that the specification in Step 4 is satisfied.

(6) When there is an edge curl at the tape contacting the tape guide in

- (i) Loosen the lock nut shown in Fig. 3-33.
- (ii) Tighten the zenith adjusting screw clockwise only 15 degrees.
- (iii) Perform Step 4 again. If the specification is not satisfied, perform Steps 5 and 6 again, but do not turn the zenith adjusting screw to the right and left more than 60 degrees from the original position.
- (iv) Tighten the lock nut until a slight resistance is felt after adjustment. Confirm that the specification in Step 4 is satisfied.

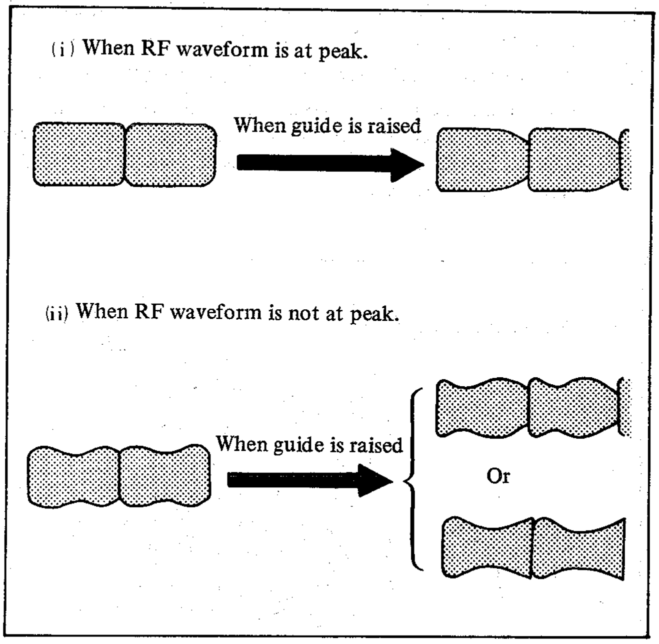
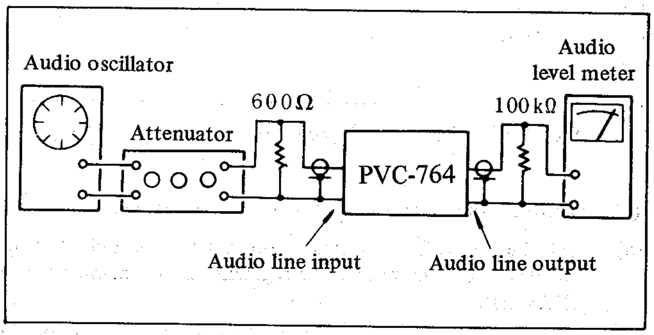

(i) When RF waveform is at peak.
When guide is raised
(ii) When RF waveform is not at peak.
When guide is raised
Or

Fig. 3-34. Adjustment of Exit Side Tracking After Replacement of ACE Assembly

3-16-3. Adjustment of Audio Head (ACE Assembly) Azimuth


Audio oscillator
Audio level meter
600Ω
100kΩ
Attenuator
PVC-764
Audio line input
Audio line output

(1) Terminate the audio line output terminal with a 100 kΩ resistor and connect an audio level meter to it.

(2) Play back the 5 kHz audio signal of alignment tape (KRr-1S, Z).

(3) Adjust the azimuth adjustment screw on the audio head for a maximum VTVM reading. (See Fig. 3-33)

3-16-4. Position Adjustment of ACE Assembly

- This adjustment consists of mechanical head mounting position adjustment and electrical tracking control center adjustment.
- As an adjustment procedure, perform the tracking control center adjustment and the mechanical adjustment of the head mounting position. If the adjustment is done is reverse order, poor tracking may be caused due to interchangeability.

(1) Connect the oscilloscope to test point TP-5 and the external trigger to test point TP-24 on the video board.

(2) Play back the 1 MHz segment of alignment tape (KR5-2H).

(3) Turn the tracking control knob and confirm that the RF output waveform level becomes its maximum in the center click position. If the specification is not met, perform the Step 4 and all the rest.

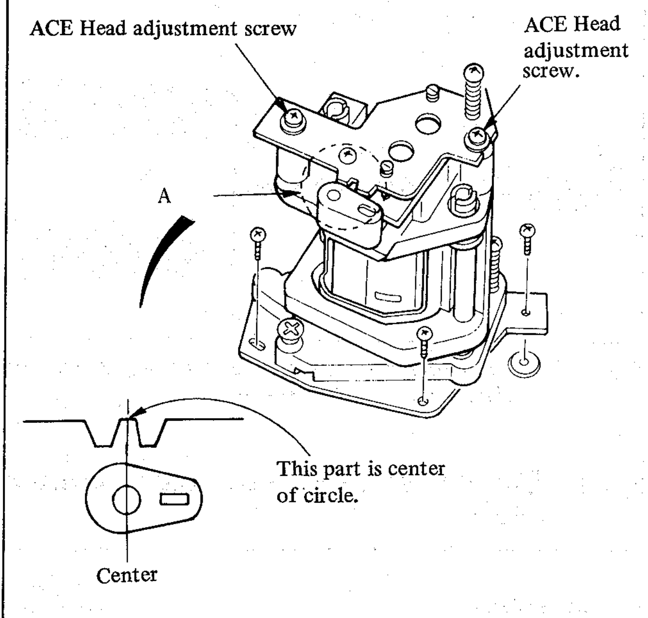

ACE Head adjustment screw
ACE Head adjustment screw.
A
This part is center of circle.
Center

Fig. 3-35. Position Adjustment of ACE Assembly

(4) Perform the tracking control center adjustment.

(5) Set the TRACKING control knob to its center detent point to play back the monoscope segment of the alignment tape (KR5-2H).

(6) Loosen two position adjusting screws of the ACE head and adjust the cut-out portion of section A for maximum RF output waveform by moving this portion.

Note: Perform adjustment so that the center of the cut-out portion of section A will almost match the center of the round hole.

(7) Play back the monoscope segment of the alignment tape and confirm that a proper image appears.

(8) Tighten the position adjusting screw of the ACE head.

1) ACE head position adj. screw.
2) ACE head position adj. screw.
3) Section A
4) (Detailed view of section A)
5) This point must be on the extension of the center line of the circle.
6) Center

3-16-5. Video Head Dihedral Adjustment ıbly

- Generally, this adjustment is not necessary except after replacement of the video head disk. (The dihedron of a video head disk for replacement purposes was adjusted precisely with a microscope at the factory and readjustment is usually not necessary.
- The judgment of video head dihedron must be performed in the condition that the monoscope signal segment of the alignment tape (KR5-2H) is played back, and the TRACKING control knob must be set to the center detent position.
- ACE assembly position adjustment has been completed prior to dihedral adjustment.

(1) With the tracking control knob set in the center detent position, a signal section is played back by the monoscope of the alignment tape (KR5-2H), to confirm that a vertical line of the monoscope signal directly below the switching pulse has been played back in two instead of one before.
If the vertical line is only one, it indicates that dihedron is proper, and no adjustment is necessary, but if there are two vertical lines, make adjustment of Step 2 and the rest.

(2) As shown in Fig. 3-36, insert two dihedral adjusting screws (Jig Ref. No. J-10) into the hole of the red and yellow adjusting screws for leads from the video head until the top portion of the adjusting screws are level with the top of the video head disk. (If insufficient tightening is made, the head of adjusting screws come into contact with the upper drum, causing failure of the video head disk to rotate; if over tightening is made, the head base is caused to move, resulting in greatly deviated dihedron of the video head.)

(3) Of these two adjusting screws, either one should be tightened further in until it is fully tightened. If the screw is still further tightened from this position, the video head begins to move, thereby achieving adjustment of dihedron.

(4) Confirm with the monoscope signal section of the alignment tape (KR5-2H) played back while keeping the adjustint screw on. If the vertical line crack is found larger than before adjustment, it is necessary to turn the now tightened adjusting screw counterclockwise, and to adjust the adjusting screw on the opposite side thereafter.
After adjustment, reconfirmation should be made by removing the adjusting screw.

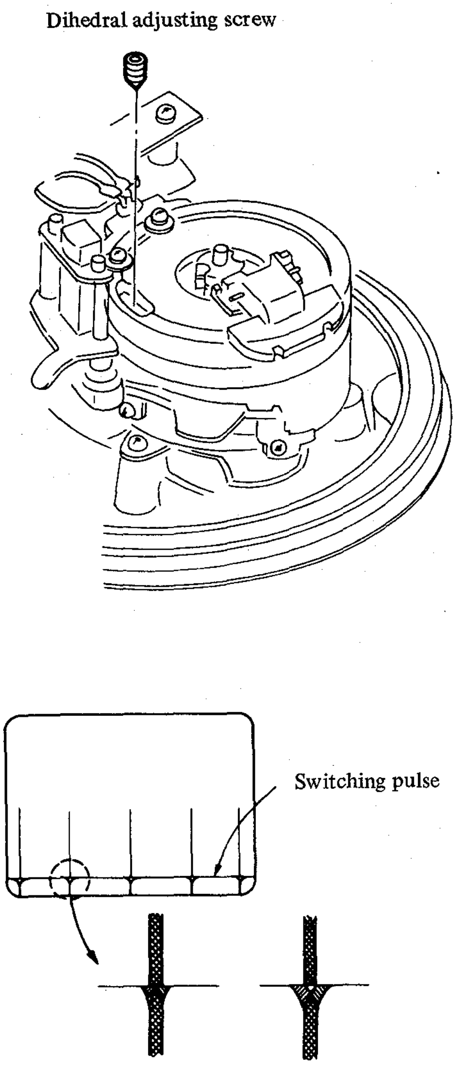

Dihedral adjusting screw
Switching pulse

Fig. 3-36. Adjustment of Video Head Dihedron

SECTION 4

ELECTRICAL ADJUSTMENT AND CHECK

4-1. REGULATOR (PWB-438) ADJUSTMENT PROCEDURES

4-1-1. Power Supply Adjustment and Check

(1) Measuring Instruments

Voltmeter (DC), Class 0.5 or higher, or a digital voltmeter with equivalent or higher accuracy.

(2) Adjustment and Check Items

2-1 REC 10 V Adjustment and Check
2-2 REC 12 V Adjustment and Check
2-3 EVER 12 V Adjustment and Check
2-4 −26 V Check
2-5 REC 32 V Check
2-6 FIP 2 V Check

(3) Adjustment and Check

Switch the VTR on, connect the voltmeter to the following measuring points, and adjust and check as follows.

	Output	Measuring Point	Adjustment	Rating	
2-1	REG 10 V	PWB-438 TP1-E	VR1	○ Output level: DC 10 ± 0.2 V ○ Ripple: Less than 5 mVp-p	0.3 A
2-2	REC 12 V	TP2-E	VR2	○ Output level: DC 12 ± 0.2 V ○ Ripple: Less than 5 mVp-p	1.1 A
2-3	EVER 12V	TP3-E	VR3	○ Output level: DC 12 ± 0.2 V ○ Ripple: Less than 5 mVp-p	0.1 A
2-4	−26 V	TP4-E	–	○ Output level: DC −26 ± 3 V	10 mA
2-5	REG 32 V	TP5-E	–	○ Output level: 31.5 ± 0.5 V ○ Ripple: Less than 0.1 Vp-p	0.1 mA
2-6	FIP 2 V	TP6-TP7	–	○ Output level: DC 2.2 ± 0.2 V	0.13 A

4-2. SYSCON ADJUSTMENT AND CHECK

(1) Measuring Instruments and Jigs

(1) Oscilloscope
(2) Digital voltmeter
(3) Cassette tape (starting and ending parts)
(4) Remote control unit RB-74E or equivalent (see the attached diagram.) (RB-77 may be used except for after recording.)
(5) Camera pause jig (see the attached diagram.)

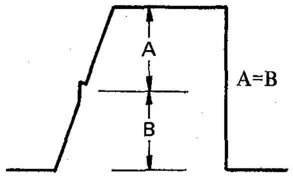
(2) Adjustment and Check Items

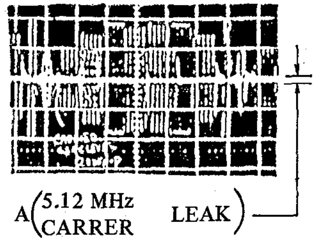
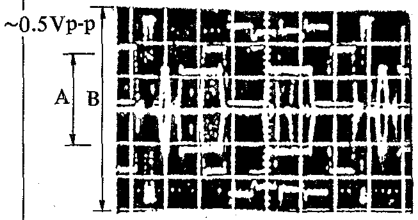
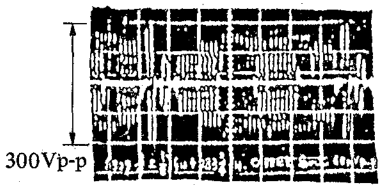
(1) Power on
(2) TV/VTR switching
(3) Cassette insertion, loading
(4) Eject operation (adjustment)
(5) FWD/PAUSE (adjustment)
(6) FF/REW
(7) CUE/REVIEW
(8) Recording
(9) End sensor (adjustment)
(10) Counter memory
(11) Repeat
(12) Takeup sensor
(13) Dew sensor
(14) Remote control (adjustment)
(15) Camera pause

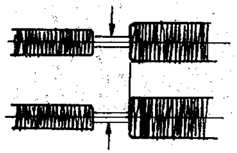
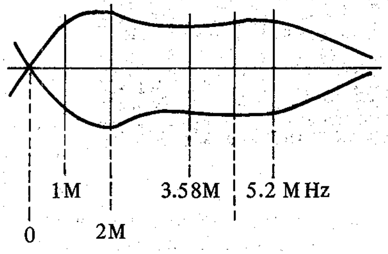
	Item	Adjustment/Check	Remarks
1	Power on reset	Push the power switch off and off three times, and confirm that operation is normal. (If so TV/VTR can be selected.)	
2	TV/VTR operation. indication	Off when power is turned on. Reversed when the TV/VTR button is pressed.	
3	Eject operation (Press STOP button to stop.)	Adjustment. Connect the oscilloscope to TP4 and TP3 (GND) on Syscon PWB, and adjust VR4 so that the unloading reel motor voltage becomes 3 ± 0.3VDC.	Only the check to be made during syscon adjustment.
4	FWD operation Pause operation (FWD)	FWD operation, indication Adjustment Connect the oscilloscope to TP4 and TP3 (GND) on Syscon PWB, and adjust VR3 so that the reel motor voltage in FWD mode becomes 2.3 ± 0.2VDC. Check pause operation and indicator	If no FWD operation takes place, check the FWD sensor Take data with PP and if the voltage meets the requirement, adjust syscon independently.
5	FF operation REW operation	FF operation, indication REW operation, indication	
6	Cue operation (FF button pressed on in FWD mode) Review operation (REW button pressed on in FWD mode)	Check cue operation and indicator Check Review operation and indicator	FWD and FF lamps light. FWD and REW lamps light.
7	REC operation	Check REC operation and indication and REC Safety.	If REC button is pressed when REC SAFETY switch is not on, cassette is ejected.
8	End sensor	Check End sensor (REW sensor) operation in the REW mode. Adjustment Connect the oscilloscope to TP2 and TP3 (GND) on Syscon PWB, and adjust VR2 so that 0.9 ± 0.1 VPP is obtained in REW mode. Check End sensor (FWD sensor) operation in the FWD or FF mode. Adjustment Connect the oscilloscope to TI1 and TP3 (GND) on Syscon PWB, and adjust VR1 so that the oscillation level in FWD or FF mode becomes 3 ± 0.3VPP.	• If the end sensor operates in the FWD, FF or CUE mode, the tape is automatically rewound. • Neither FF nor FWD operation can be performed without oscillation. • Neither REW nor NEVIEW operation can be performed without oscillation.
9	Counter memory	When the memory switch is on, the REW mode must stops as the counter adds up from 0000 to 9999. When halted, the counter must read anywhere from 9995 to 9999.	Counter memory does not work if the repeat switch is on.
10	Repeat	Check Repeat operation	If the repeat switch is on, the tape rewound to its starting end is fed forward again.
11	Takeup sensor	Check Takeup sensor operation	• If the reel base stops when the tape is given in 1 second. Alarm: STOP indicator flashes. • In the EJECT mode, alarm is given in 0.5 seconds.

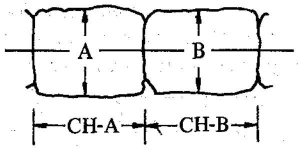
	Item	Adjustment/Check	Remarks
12	Dew sensor	Check Dew sensor operation, and indicator Ground the terminal CN2-12 on the function PWB.	
13	Remote control	Adjustment Connect the oscilloscope to TP1 and TP-E (GND) on Function PWB, and adjust VR1 so that 7.6 ± 0.05V is obtained. Check operation in each mode.	Tape cannot be ejcted by remote control stop.
14	Camera pause	Check if operation can be performed	Camera pause is valid only in the REC mode.

4-3. VIDEO ADJUSTMENT PROCEDURES

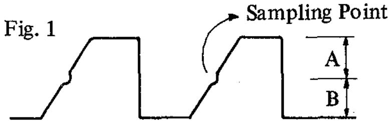
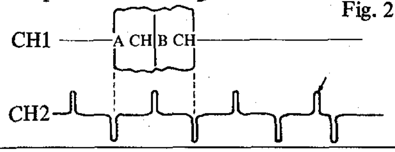
No.	Adjustment/ Check Item	Mode	Measuring Point	Oscilloscope Conditions			Measuring Point	Adjusting Point	Specifications	Adjusting Conditions	Edition
				Probe	V range H range	Trigger					
1	8.6 V Reg. adjustment	EE	Degital voltmeter	—	—	—	CHROMA/ P.A CN12 – 2		8.6 ± 0.05 V DC		
2	4.43 MHz VXO adjustment	EE VIDEO IN Nonconect	Frequency counter Oscilloscope	10:1	V: 20mV H: 0.2μsec	INT	CHROMA/ P.A PT302	CHROMA/ P.A T301	f: 4,433,619 ± 10 Hz Level: 0.8 ± 0.2 Vp-p		
3	4.43 MHz X'tal OSC adjustment	PB	″	″	″	″	″	CHROMA/ P.A T-302	f: 4,433,619 ± 10 Hz Level: 1.0 ± 0.1 Vp-p		
4	Video signal Output level check	EE PAL Color Bar Sig.	Oscilloscope	″	″	″	Y/PROCESS TP12	—	1.0 ± 0.1 Vp-p		
5	AFC adjustment	″	″	″	V: 50mV H: 10μsec	INT – Slope	CHROMA/ P.A TP303	CHROMA/ P.A VR301	 Adjust VR301 until the lock point of the waveform showing at TP303 agrees with the slope center.		
6	ACC adjustment	″	″	″	V: 20mV H: 10μsec	INT	CHROMA/ P.A TP207	CHROMA/ P.A VR202	Adjust VR202 until the level of the color signal showing at TP207 is 0.45 ± 0.02 Vp-p		

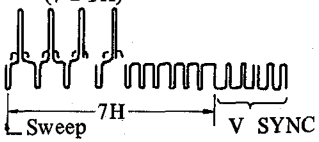
No.	Adjustment/ Check Item	Mode	Measuring Point	Oscilloscope Conditions			Measuring Point	Adjusting Point	Specifications	Adjusting Conditions	Edition
				Probe	V range H range	Trigger					
7	5.12 MHz carrier balance adjustment	EE PAL Color Bat. Sig.	Oscilloscope	10:1	V: 5mV H: 5μsec	INT	CHROMA/ P.A TP205	CHROMA/ P.A VR205	Adjust VR205 until the 5.12 MHz carrier component of the chroma signal showing at TP205 is lowered to the minimum.  A< 30 mVp-v		
8	Pilot burst level adjustment	"	"	"	V: 10mV H: 10μsec	"	CHROMA/ P.A TP206	CHROMA/ P.A VR203	Adjust so that the chroma signal showing at TP206 is as shown in Fig. $\frac{B}{A} = 170 \pm 10\%$ 		
9	Chroma REC level adjustment	"	"	"	"	"	CHROMA/ P.A TP203	CHROMA/ P.A VR204	Adjust VR204 until the chroma signal level showing at TP203 is 300 ± 10 mVp-p 		

<table>
<tr><th rowspan="2">No.</th><th rowspan="2">Adjustment/ Check Item</th><th rowspan="2">Mode</th><th rowspan="2">Measuring Point</th><th colspan="3">Oscilloscope Conditions</th><th rowspan="2">Measuring Point</th><th rowspan="2">Adjusting Point</th><th rowspan="2">Specifications</th><th rowspan="2">Adjusting Conditions</th><th rowspan="2">Edition</th></tr>
<tr><th>Probe</th><th>V range H range</th><th>Trigger</th></tr>
<tr><td>10</td><td>Y-RF Sig.
REC level
adjustment</td><td>REC
PAL color
Bar Sig.</td><td>Oscilloscope</td><td>10:1</td><td>V: 5mV
H: 0.5msec</td><td>EXT
CHROMA/
P.A
TP310</td><td>CHROMA/
P.A
TP501</td><td>CHROMA/
P.A
VR501</td><td>Adjust VR501 until the V. Sync. signal level showing at TP501 is 130 ± 10 mVp-p.

V.Sync. Signal 130mVp-p</td><td></td><td></td></tr>
<tr><td>11</td><td>PB RF Freq.
response adj.
1) Freq. response
• A-CH</td><td>KR4-1C
Playback</td><td>"</td><td>"</td><td>V:5mV
H: 2msec</td><td>EXT
CHROMA/
P.A
TP310
⊖ SLOPE</td><td>CHROMA/
P.A
TP505</td><td>CHROMA/
P.A
VR505</td><td>Adjust VR505 until the freq. response showing at TP505 as follows.

 <table><tr><th>f</th><th>response</th></tr><tr><td>3.6 MHz</td><td>100%</td></tr><tr><td>4.5 MHz</td><td>85^{+15}_{-0}%</td></tr><tr><td>5.2 MHz</td><td>85^{+15}_{-0}%</td></tr></table></td><td></td><td></td></tr>
<tr><td></td><td>• B-CH</td><td>"</td><td>"</td><td>"</td><td>"</td><td>EXT
CHROMA/
P.A
TP310
⊕ SLOPE</td><td>"</td><td>CHROMA/
P.A
VR503</td><td></td><td></td><td></td></tr>
</table>

No.	Adjustment/ Check Item	Mode	Measuring Point	Oscilloscope Conditions			Measuring Point	Adjusting Point	Specifications	Adjusting Conditions	Edition
				Probe	V range H range	Trigger					
	2) Channel balance adjustment	KR4-1C Playback	Oscilloscope	10:1	V: 5mV H: 5mces	EXT CHROMA/ P.A TP310 ⊕ SLOPE	CHROMA/ P.A TP505	CHROMA/ P.A VR504	Adjust VR504 until the CH-A and CH-B signals level showing at TP505 is equal. A=B 		

4-4. SERVO ADJUSTMENT PROCEDURES

No.	Adjustment/ Check Item	Mode	Measuring Point	Oscilloscope Conditions			Measuring Point	Adjusting Point	Specifications	Adjusting Conditions	
				Probe	V range H:range	Trigger					
1	Drum disc adjustment	REC PAL signal input	Oscilloscope	10:1	V:0.2V H:5mSec	EXT S /A TP2 + SLOPE	SERVO/A TP13	SERVO/A VR5	Fig. 1  Adjust VR5 until A=B. (The above waveform must be synchronized by external trigger.)		
2	Capstan disc adjustment	REC PAL signal input	"	"	"	"	SERVO/A TP14	SERVO/A VR8	Adjust VR8 until the waveform is the same as in Fig. 1.		
4	Tracking control center adjustment	KR2-5C playback	Oscilloscope CH1 CH2	10:1 10:1	V:10mV H:5mSec VARIABLE V:50mV Chop mode	EXT CHROM/ P.A TP310 – SLOPE	CHROMA/ P.A TP505 SERVO/A	SERVO/A VR6 (ACE Head)	1) Move the ACE adjusting panel to a point where RF output is reproduced in the phase relationship shown in Fig. 2. 2) Adjust VR6 until CTL and RF output waveforms agree. Fig. 2 	Set the tracking VR to the center where it clicks.	
5	CTL positioning	KR2-1C	Oscilloscope	"	V:10mV H:5mSec	"	CHROMA/ P.A TP505	ACE Head	1) Make a fine adjustment of the ACE adjusting panel so that RF output will be maximum.	Set the tracking VR to the center where it clicks.	

No.	Adjustment/ Check Item	Mode	Measuring Point	Oscilloscope Conditions			Measuring Point	Adjusting Point	Specifications	Adjusting Conditions	
				Probe	V range H range	Trigger					
6	RF switching position adjustment 1) PG (A)	KR4-4C playback	Oscilloscope	10:1	V:20mV H:50μSec	EXT S/A TP1 − SLOPE	Y PROCESS TP12	SERVO/A VR1	Adjust VR1 so that the tailing edge of the vertical sync signal and the sweep start point will be 448μsec. Rating: 448 ± 70μsec (7 ± 1H)  Fig. 3	Set the tracking VR to the center where it clicks.	
	2) PG (B)	"	"	"	"	EXT S/A TP1 + SLOPE	"	SERVO/A VR2	Adjust VR2 until the waveform is the same as shown in Fig. 3.	"	
7	Adjusting drum lock phase in record mode	REC PAL signal input	"	"	V:20mV H:50μSec	"	Y PROCESS TP12	SERVO/A VR3	Adjust VR3 so that the tailing edge of the vertical sync signal and the sweep start point will be 448μsec. Rating: 448 ± 70μsec (7 ± 1H) (See Fig. 3.)		

4-5. AUDIO ADJUSTMENT PROCEDURES

No.	Adjustment/ Check Item	Mode	Measuring Point	Oscilloscope Conditions			Measuring Point	Adjusting Point	Specifications	Adjusting Conditions	Edition
				Probe	V range H range	Trigger					
1	Playback adjustment 1) Frequency response adjustment	KR3-4C playback	Audio level meter	—	—	—	AUDIO LINE OUT (100KΩ terminated)	S/AUDIO VR202	5 KHz 333 Hz $= 0^{+1}_{-5}$ dB If the above specifications are not met when VR202 is turned fully clockwise adjust from its maximum position as follows.	(As viewed from the parts side)	First edition on June 7, 1982
	2) Output level adjustment	KR3-1C playback (333 Hz)	〃	—	—	—	〃	S/AUDIO VR203	−5 ± 0.5 dB After adjustment, output must be off when the CUE or REVIEW mode is selected.		
2	EE output level check	E.E AUDIO IN 333 Hz, −10 dB	〃	—	—	—	〃	—	−5 ± 3 dB		
3	Bias OSC check 1) Oscillator frequency check	REC	Frequency counter (with 10:1 probe)	—	—	—	Between full erase head's red lead terminal and GND	—	68^{+10}_{-8} KHz		
	2) Oscillation level check (1)	〃	Oscilloscope	10:1	V:1V H:10μSec	INT	〃	—	35 ± 5 Vp-p		
	3) Oscillation level chec (2)		〃	〃	V:0.5V H:10 μSec	〃	Between full erase head's blue lead terminal and GND	—	11 ± 3 Vp-p		

No.	Adjustment/ Check Item	Mode	Measuring Point	Oscilloscope Conditions			Measuring Point	Adjusting Point	Specifications	Adjusting Conditions	Edition
				Probe	V range H range	Trigger					
4	Bias level adjustment	Self-record/ playback See the Specifications column.	Oscilloscope, Audio level meter	10:1	V:1V	INT	S/AUDIO TP202	S/AUDIO VR201	1) Adjust VR201 until the bias boltage at TP202 is Vp-p. 2) Apply a 333 Hz, −30 dB signal to AUDIO IN to record it. 3) Then, apply a 7 kHz, −30 dB signal to record it. 4) Play back the parts recorded in Steps 2 and 3, and check if their output levels meet the following. 7 kHz output level 333 Hz output level $\Big\}\,^{+1}_{-2}$ dB 5) If these specifications are not met, adjust VR201, and repeat Steps 2, 3 and 4.	Disconnect the probe from TP202 bofore recording.	
5	Self-record/ playback output level check	Self/record playback • PAL signal IN • AUDIO IN 333 Hz, −10 dB	Audio level meter	—	—	—	AUDIO LINE OUT	—	−5 ± 3 dB		
6	Self-record/ playback frequency respinse check	Self/record playback	Frequency Response Checker (ATT:30 dB LEVEL: Max	—	—	—	AUDIO LINE OUT (100KΩ terminated)	—	Against 333 Hz output level: 100 Hz. . . . . $^{+2.5}_{-6}$ dB 5 kHz. . . . . ± 3 dB 8 kHz. . . . . $^{+3}_{-6}$ dB		
7	Self-record/ playback signal-to-noise ratio check	Self/record playback PAL signal IN • AUDIO IN See the Specifications column.	Audio level meter Filter (333 Hz . . . Flat Noise . . . JAS-A	—	—	—	″	—	1) Short AUDIO LINE IN and record. 2) Then, apply a 333 Hz, −10 dB signal to record it. 3) When the recorded parts in Steps 1 and 2 are played back, the signal-to-noise ratio must be as follows: S/N = More than 40 dB		

No.	Adjustment/ Check Item	Mode	Measuring Point	Oscilloscope Conditions			Measuring Point	Adjusting Point	Specifications	Adjusting Conditions	Edition
				Probe	V range H range	Trigger					
8	Self-record/ playback distortion check	Self/record playback PAL signal IN • AUDIO IN 400 Hz, –10 dB	Distortion meter	—	—	—	AUDIO LINE OUT (100KΩ terminated)	—	Distortion factor: Less than 4%		
9	Wow and flutter check	Self-record/ playback • AUDIO IN 3 kHz, –10 dB	Wow and flutter meter	—	—	—	″	—	1) Wow and flutter: Less than 0.5 % (JIS, WTD) 2) Flutter: Less than 0.6 % (JIS)		
10	Microphone input circuit check	E.E Apply a 333 Hz, –60 dB to MIC IN.	Audio level meter	—	—	—	Audio level meter	—	The EE output level of the microphone input must meet the following. –5 ± 5 dB		

4-6. TIMER ADJUSTMENT PROCEDURES

G Timer Adjustment and Check

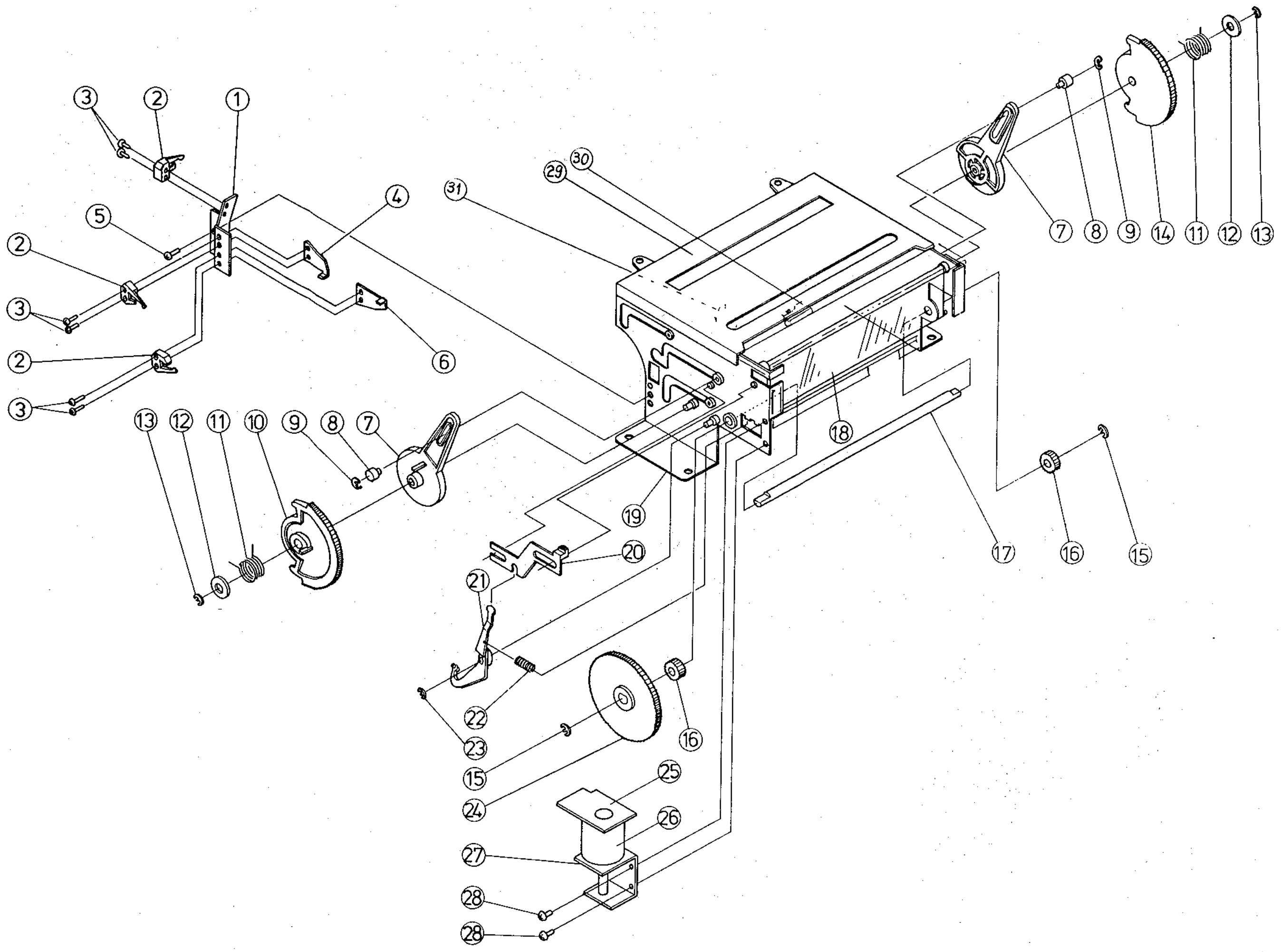
Measuring instrument: 7-digit frequency counter

	Item	Adjustment/Check	Remarks
1	Refernce clock adjustment	Short FREQ SET terminal on the timer PWB, and connect the AC cord to electrical outlet. Adjust FREQ CHK terminal's perood with frequency counter. Adjust trimer capacitor C5. Rating: 1.000000 ± 0.000001 sec	If the super capacitor for power backup is charged, the timer is not reset, and thus cannot be measured. Ground Pin 9 of IC4 (for about 5 sec) before plugging the AC cord to discharge the capacitor before making adjustment. ● Take data with PP, and determine whether to use MP in making this adjustment.
2	Reset	Restore the shorted FREQ SET terminal, and connect the AC cord into electrical outlet again. The timer must then be reset. SUN AM 12:00 flashing (Present time mode)	If the timer is not reset, repeat Step 1.
3	Time adjustment	Time adjustment can be made in the present time mode. Press the time set button and each of the following buttons. ● Day of week ● Hour ● 10s of minutes ● Minute	
4	Reservation setting	Reservation operation can be indicated in the program reservation mode. ● Reservation mode switching ● Program ● Day of week ● Start time (hour, 10s of minutes, minute) ● Recording time (hour, 10s of minutes, minute) ● Cancellation ● Channel designation (flash)	In the REC mode, the present time is indicated
5	Timer recording	Timer recording operation Preset a reservation ahead of the present time within the same week, and adjust the preset reservation time to the present time. Recording starts when it is set to the present time.	● Power switch: Off ● Timer switch: On ● Recordable cassette must be loaded in place.
6	Normal mode	1) Push the power switch on, and the channel LED lights. When the power switch is pushed off, it goes out. 2) Recording time is added up during recording. The count is stopped when the pause button is pressed.	The channel LED keeps flashing in the program reservation mode.
7	Power backup	Turn power off, and a few seconds later, turn power on again. Check if the indications are the same as before power switchoff.	Keep power on for longer than 5 seconds before turning it off (to build up electric charge), and check as described at left.

SECTION 5

EXPLODED VIEW & MECHANICAL PARTS LIST

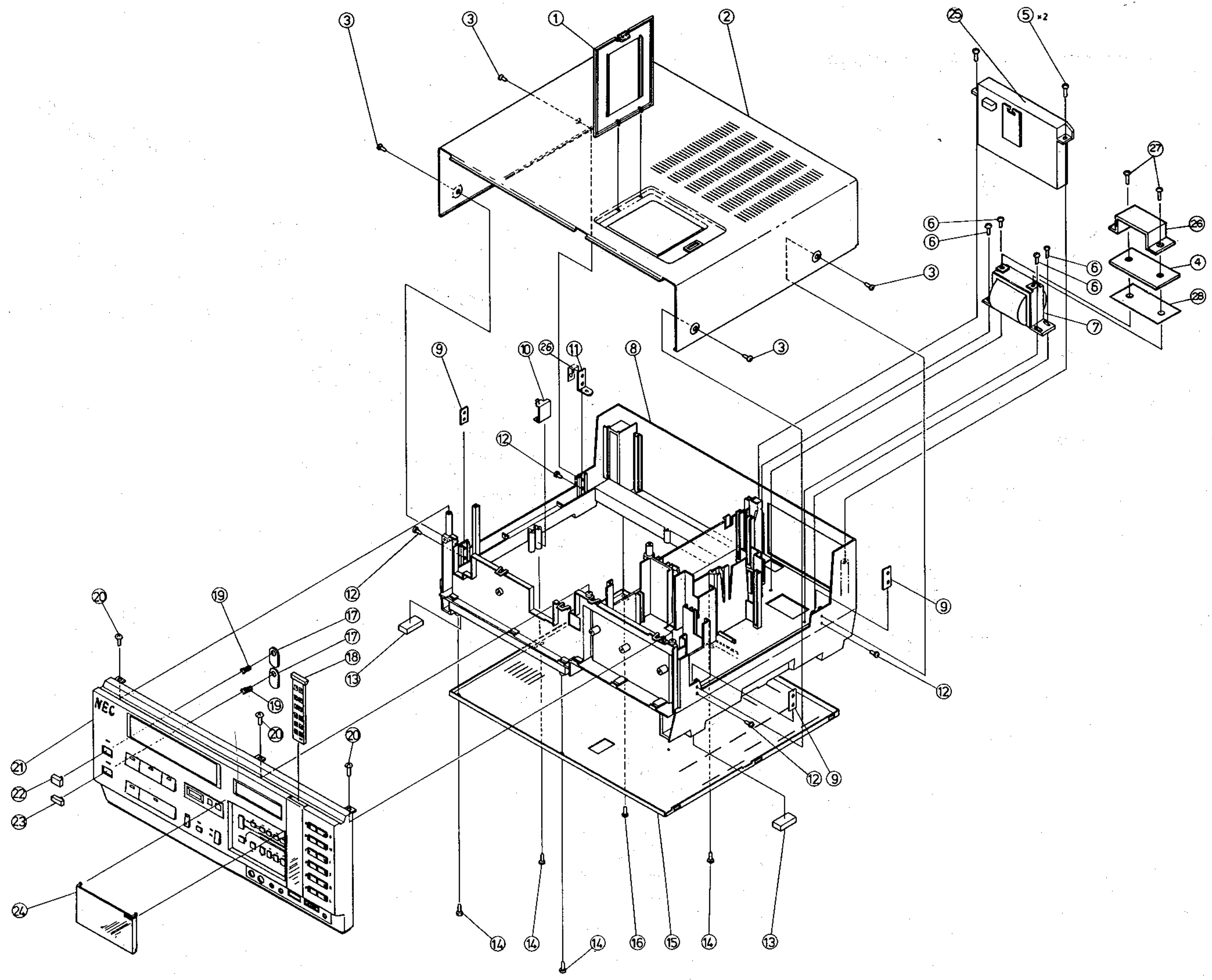
5-1. CASSETTE HOUSE ASSEMBLY



CASSETTE HOUSE ASSEMBLY

No.	*Part No.*	*Description*	*Remarks*
19	16173343	Front Loading Ass'y	
1	16570161	├ Holder, Switch	
2	65907067	├ Switch	
3	91012051	├ CP1MSx 2x10x15BF	
4	16570141	├ Nut Plate	
5	15875871	├ Screw M3x5x15BF	
6	16570151	├ Nut Plate	
7	16431711	├ Arm.	
8	16431771	├ Roller (3)	
9	18851351	├ E-Ring (2.5)	
10	16431691	├ Gear (L)	
11	16570271	├ Spring, Clutch	
12	91510401	├ Screw PIWA 4x15BF	
13	11627561	└ E-Ring (3)	
14	16431701	Gear (R)	
15	11628241	E-Ring (4)	
16	16431731	Gear	
17	16530161	Shaft, Gear	
18	16431881	Front Cover	
20	16431791	Slider	
21	16431781	Lever	
22	16570251	Spring	
23	11627561	E-Ring (3)	
24	16431831	Warm-wheel	
25	72374461	PWV-446	
26	79502028	Motor	
27	16172401	Motor S. Ass'y	
28	16876161	Screw M2.6x4x15BF	

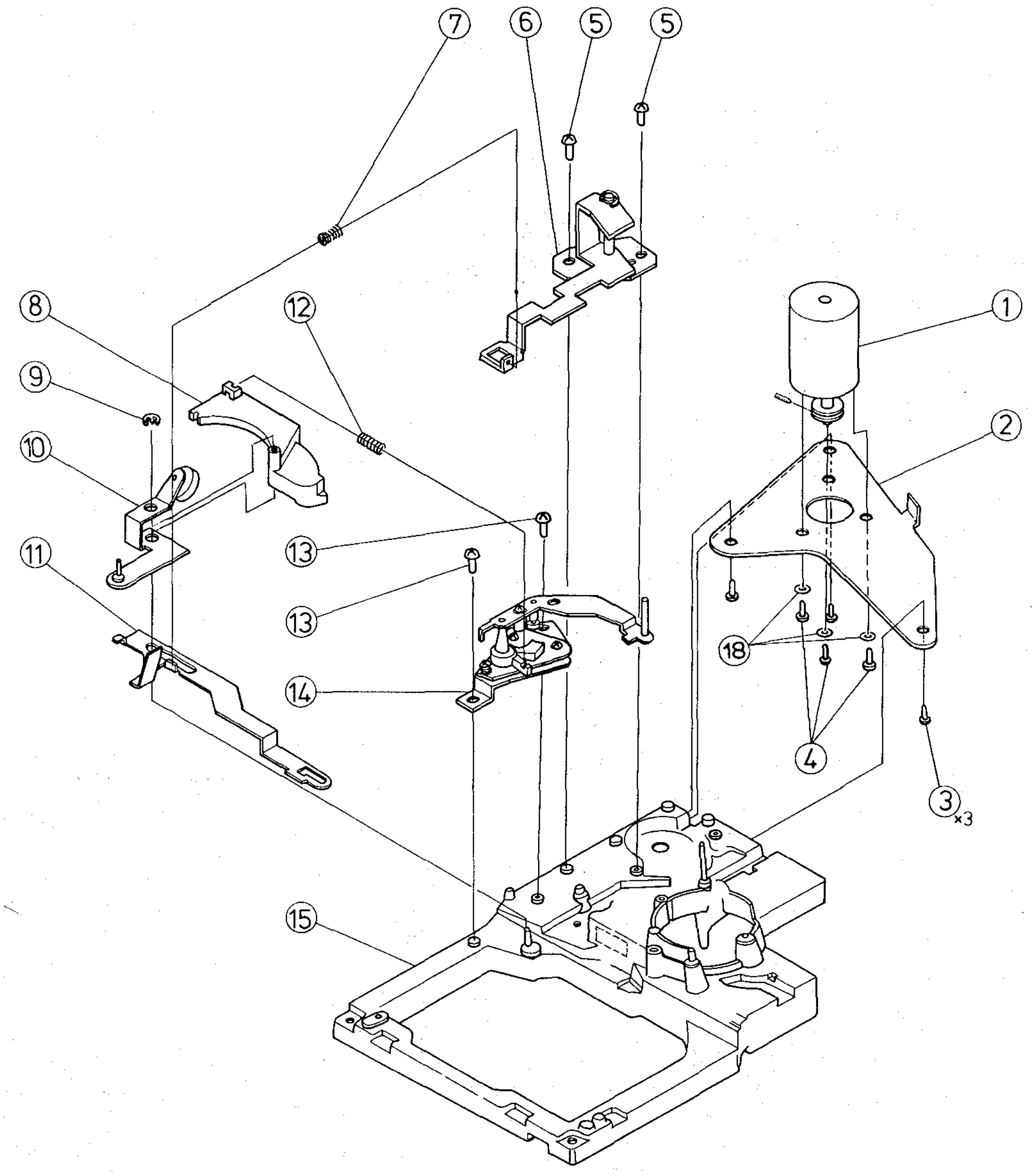
5-2. CABINET ASSEMBLY



CABINET ASSEMBLY

No.	Part No.	Description	Remarks
2	16173102	Top Case Ass'y	
1	16173241	Pre-Set Case Ass'y	
3	16876401	TP Screw M4x8x3GFF	
5	16876141	Screw 2CPTS3x12x15BF	
6	16876431	Screw 2CPTS4x12x15BF	
7	82207ML1	Power Transformer Ass'y	
8	16172926	Bottom Chassis Ass'y	
9	16569991	├ Bracket, Top Cover	
10	16570871	├ Shield Plate	
11	16570881	├ Bracket, Top case	
12	91053031	├ Screw	
13	16431971	└ Foot	
14	16876141	Screw 2CPTS3x12x15BF	
15	16570002	Bottom Board	
16	16875531	Screw M3x8x15BF	
21	16173127	Front Panel Ass'y	
17	16429731	├ Holder, Spring	
18	16431621	├ Channel Indicator	
19	16570861	├ Spring, Power Knob	
20	16876431	Screw 2CPTS4x12x15BF	
22	16431551	├ Knob, Power Reg	
23	16431561	├ Knob, Timer Rec	
24	16431531	└ Timer Lid.	
25	71128504	Antenna Terminal Ass'y	
4	72374371	└ Line Filter PWB Ass'y	
26	16627381	Shield Plate	
27	16875551	Screw M3x8x15BF	
28	16627391	Hield Plate	

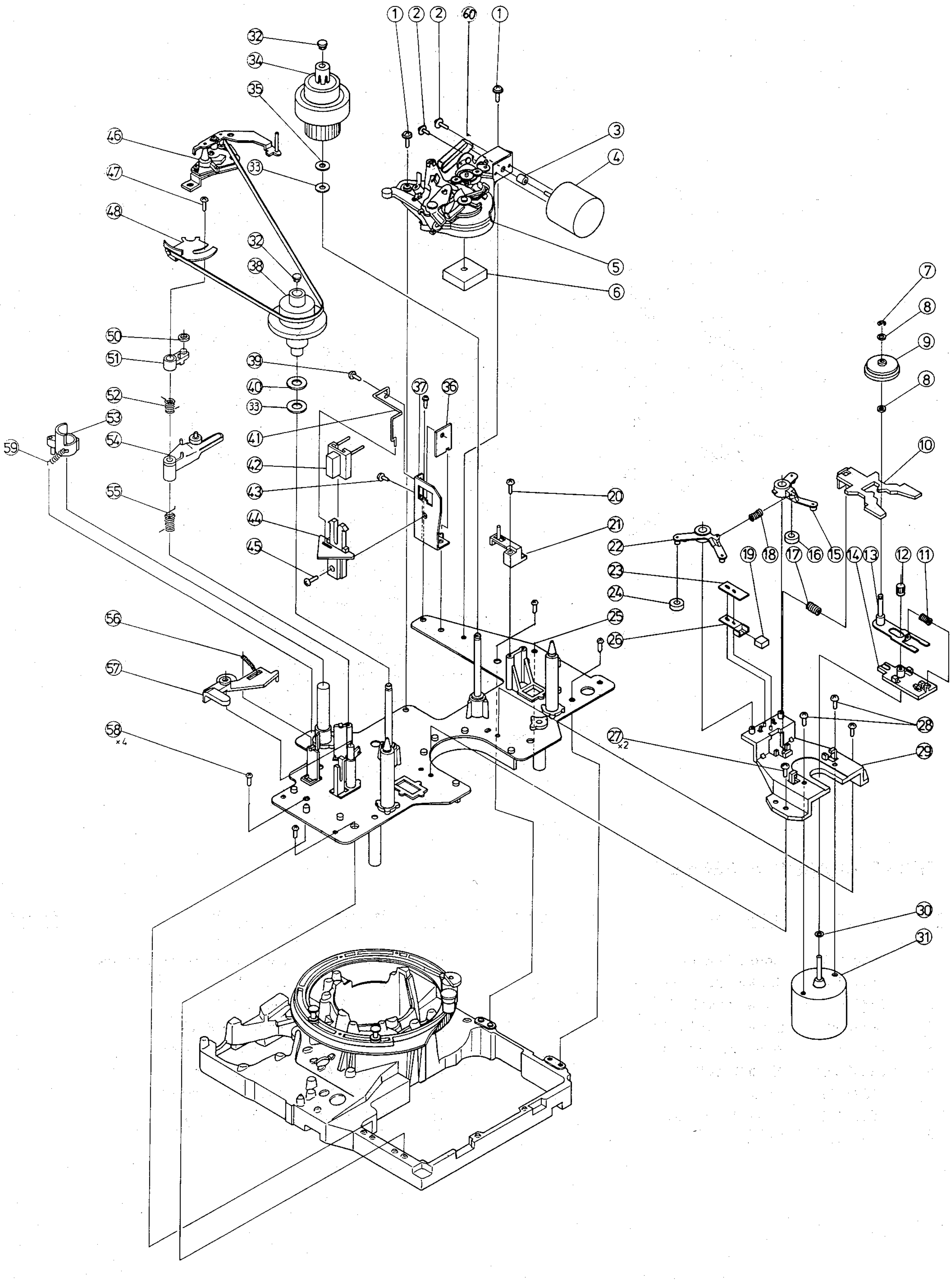
5-3. MECHA CHASSIS ASSEMBLY



MECHA CHASSIS ASSEMBLY

No.	*Part No.*	*Description*	*Remarks*	*No.*	*Part No.*	*Description*	*Remarks*
1	79502034	Motor, Capstan		10	16172621	Lever Ass'y (2), Tension Reg.	
2	16571131	Bracket, Capstan Motor		11	16570631	Lever, Drive	
3	16876081	Screw 3x8x15BF		12	16570591	Spring, BT	
4	16875501	Screw M2.6x4.15BF		13	16875531	Screw M3x8x15BF	
5	16875531	Screw M3x8x15BF		14	16172941	S-tension reg. Ass'y	
6	82203KA1	Pinch S. Ass'y		15	82203HA1	Mecha Chassis S. Ass'y	
7	16570461	Spling		16	16875231	Screw 2.6x5x35KF	
8	16432221	Lever, Tension Reg.		18	91490261	SIWAx2.6x15BF	
9	11627571	E-Ring					

5-4. SUB CHASSIS ASSEMBLY



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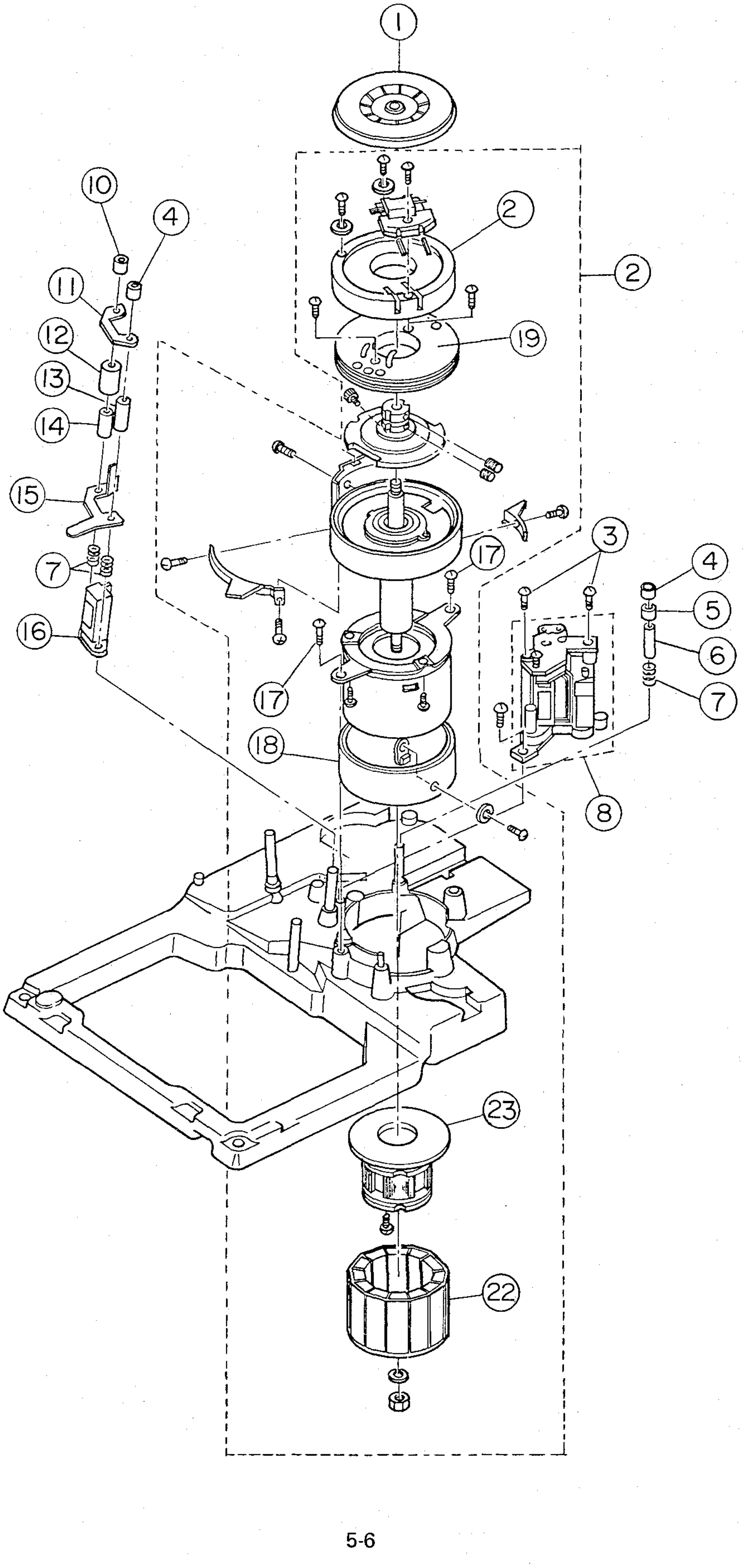
SUB CHASSIS ASSEMBLY

No.	*Part No.*	*Description*	*Remarks*
1	16876081	Screw STB 3x8	
2	16876381	Screw M2.6x6x15BF	
3	16432081	Motor, Pulley	
4	79502029	Motor	
5	16172851	Cam Box Ass'y	
6	65183011	└─Switch, Rotary	
20	16876421	Screw 2.6x8	
21	65907063	Switch Leaf	
25	16432731	Chassis, Sub	
29	16172841	Break Ass'y Main	
7	11627571	├─E Type Ring	
8	16626541	├─Plyslider (3)	
9	16172931	├─Ring Ass'y Idler	
10	16432261	├─Slide Plate	
11	16570671	├─Spring, Idler	
12	16530991	├─Rulley, Motor	
13	16172631	├─Slide Plate Ass'y, Idler	
14	16432301	├─Base, Idler	
15	16432271	├─Arm, Break	
16	16432311	├─Rubber, Break	
17	16570661	├─Spring, Slide	
18	16570651	├─Spring, Main Break	
19	16627121	├─Idler Shue	
22	16432281	├─Arm, Break (L)	
23	16571221	├─Idler Release Plate	
24	16432311	├─Rubber, Break	
26	16571291	├─Idler, Release Plate	
27	16876081	├─Screw STB 3x8	
28	16875661	├─Screw M2.6x5x15BF	
30	16627181	├─Poly Slider	
31	79502030	└─Motor	
32	16432761	Cap, Shaft	
33	16876221	Spacer	

No.	*Part No.*	*Description*	*Remarks*
34	16172661	TU Reel Ass'y	
35	16616531	Spacer (Reel)	
36	82203LG1	Noise Filter PWB Sub Ass'y	
37	16570751	Hold Plate, end Sensor	
38	16172671	S-Reel Ass'y	
39	16876081	Screw STB 3x8x15BF	
40	16626531	Spacer (Reel)	
41	16570761	Wire, end Sensor	
42	79599381	Head, Sensing	
43	16876081	Screw STB 3x8x15BF	
44	16432371	Holder, end Sensor	
45	16876081	Screw STB 3x8x15BF	
46	16172941	S-Tension Regulator	
47	16172711	Screw 3x8x15BF	
48	16172711	Tension Regulator Band Ass'y	
50	16432311	Brake Gum	
51	16432351	Brake Arm(s)	
52	16570701	Brake Spring(s)	
53	16432231	Tension Regulator Lever(s)	
54	16172641	Brake Release Arm Ass'y	
55	16570691	Spring, Brake Release	
56	16570621	Spring, Soft Break	
57	16432241	Break, Soft	
58	16875531	Screw 3x8x15BF	
59	16570611	Spring, Tension Reg. Lever	
60	16432191	Belt, Roading	

5-5. DRUM ASSEMBLY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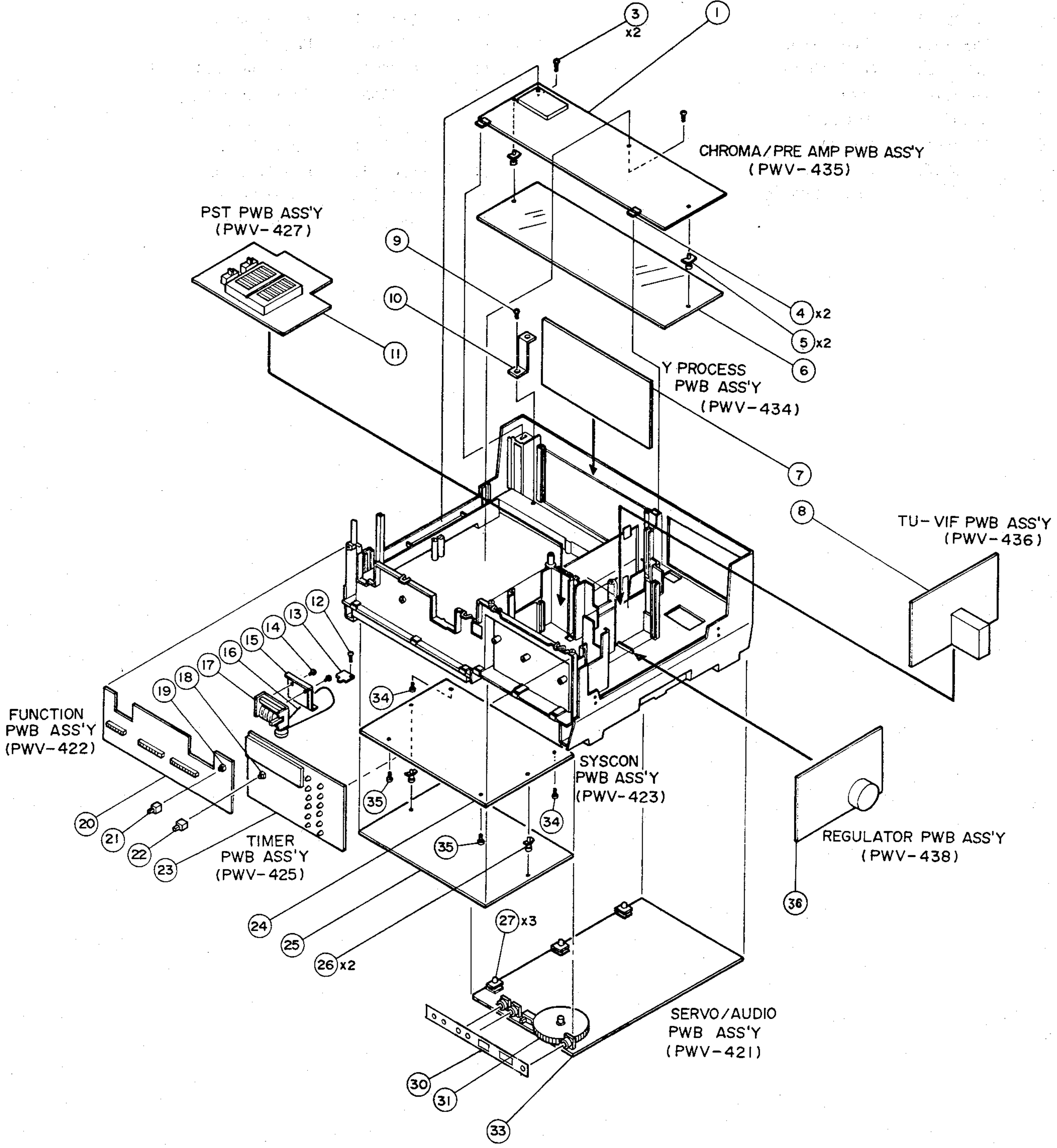
DRUM ASSEMBLY

No.	*Part No.*	*Description*	*Remarks*
2	16170651	Drum Ass'y	
3	16870811	Screw 3x8x15BF	
4	16529821	Nut (1)	
5	16529871	Guide Flange	
6	16529851	Guide Sleeve	
7	16567141	Spring	
8	82203PA1	ACE Ass'y	
10	16529811	Nut (1)	
11	16567161	Guide Plate	
12	16170721	Guide Roller Ass'y	
13	16529851	Guide Sleeve	
14	16529881	Guide Sleeve (1)	
15	16569771	Tape Support	
16	79501034	Erase Head	
17	16875061	Screw M4x8x15BF	
18	16170661	Drum Shield Ass'y	
19	16171741	Video Head	
20	16993811	Upper Drum	
21	16568741	Dew Terminal	
22	79598138	Stator Ass'y	
23	79598139	Rotor Ass'y	

5-6. PWB ASS'Y



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CHROMA/PRE AMP PWB ASS'Y
(PWV-435)
PST PWB ASS'Y
(PWV-427)
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5 x2
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Y PROCESS
PWB ASS'Y
(PWV-434)
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8
TU-VIF PWB ASS'Y
(PWV-436)
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FUNCTION
PWB ASS'Y
(PWV-422)
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SYSCON
PWB ASS'Y
(PWV-423)
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TIMER
PWB ASS'Y
(PWV-425)
35
REGULATOR PWB ASS'Y
(PWV-438)
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26 x2
27 x3
SERVO/AUDIO
PWB ASS'Y
(PWV-421)
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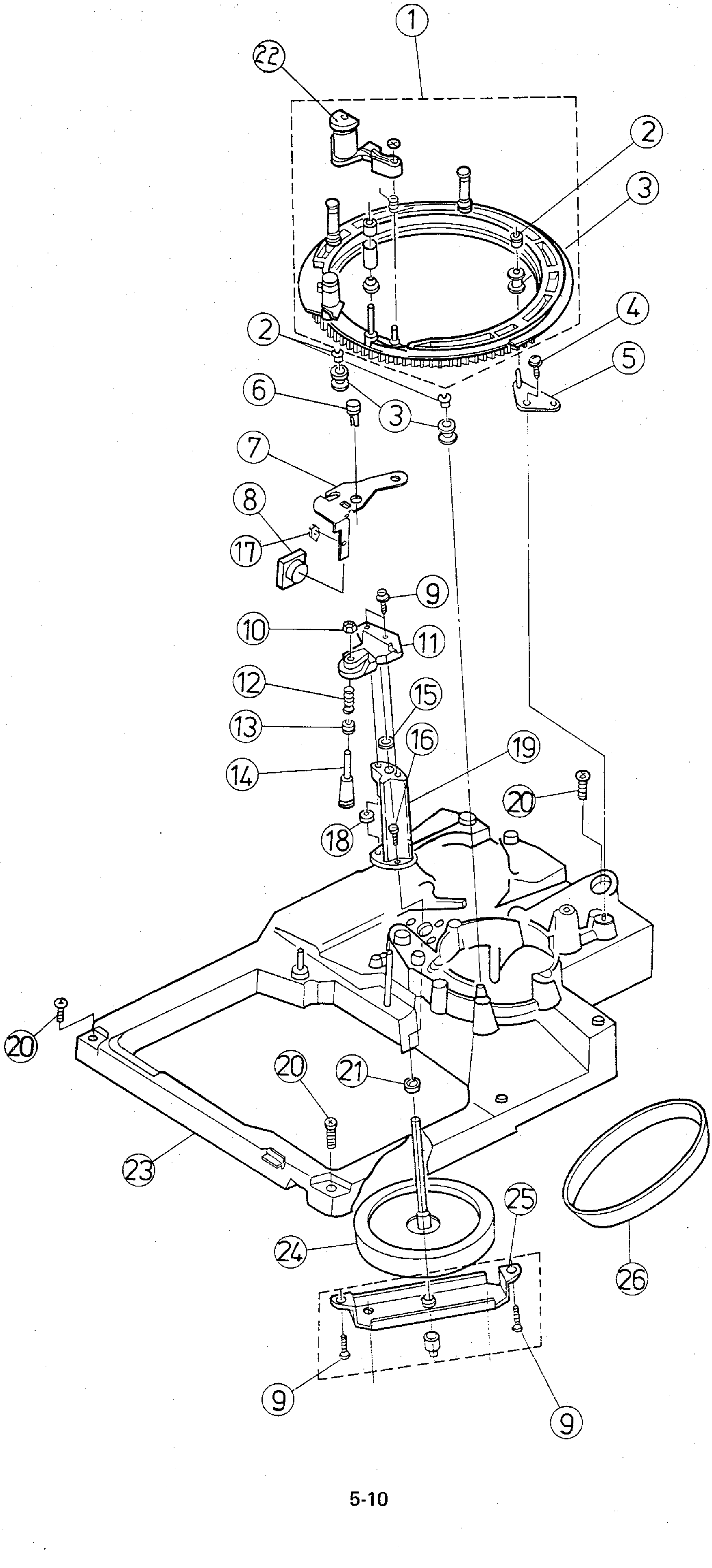
No.	Part No.	Description	Remarks
1	81205L01	CHROMA/PRE-AMP PWB Ass'y	
3	16876081	Screw STB 3x8x15BF	
4	16286431	Hinge	
5	16286291	Spacer, Support	
6	16616981	Video Shield Plate	
7	81206B01	Y-PROCESS PWB Ass'y	
8	81207E01	TU-VIF PWB Ass'y	
9	16876141	Screw 3x12x15BF	
10	16571301	PWB, Bracket	
11	81206Q01	PST PWB Ass'y	
12	16875521	Screw M3x6.15BF	
13	81203TV1	TU Sens PWB V. Ass'y	
14	16876391	Screw 2.6x6x15BF	
15	16570431	Bracket, Counter	
16	16432421	Belt Counter	
17	16386451	Counter	
18	65180020	Switch, Slide	
19	65330041	Switch, Push	
20	81205K01	Function PWB Ass'y	
21	16432641	Button, Memory	
22	16434411	Timer SW Knob	
23	81205F01	Timer PWB Ass'y	
24	81205D01	Syscon PWB Ass'y	
25	16627131	Insulating Plate, Syscon	
26	16286291	Spacer, Support	
27	16286431	Hinge	
30	16627311	Shield Cloth	
31	16430091	Knob, Tracking	
33	81205C01	Servo/Audio PWB Ass'y	
34	16876081	Screw STB 3x8x15BF	
35	16876141	Screw 2x12x15BF	
36	81205A01	Regulator PWB Ass'y	

5-7. MECHA CHASSIS ASSEMBLY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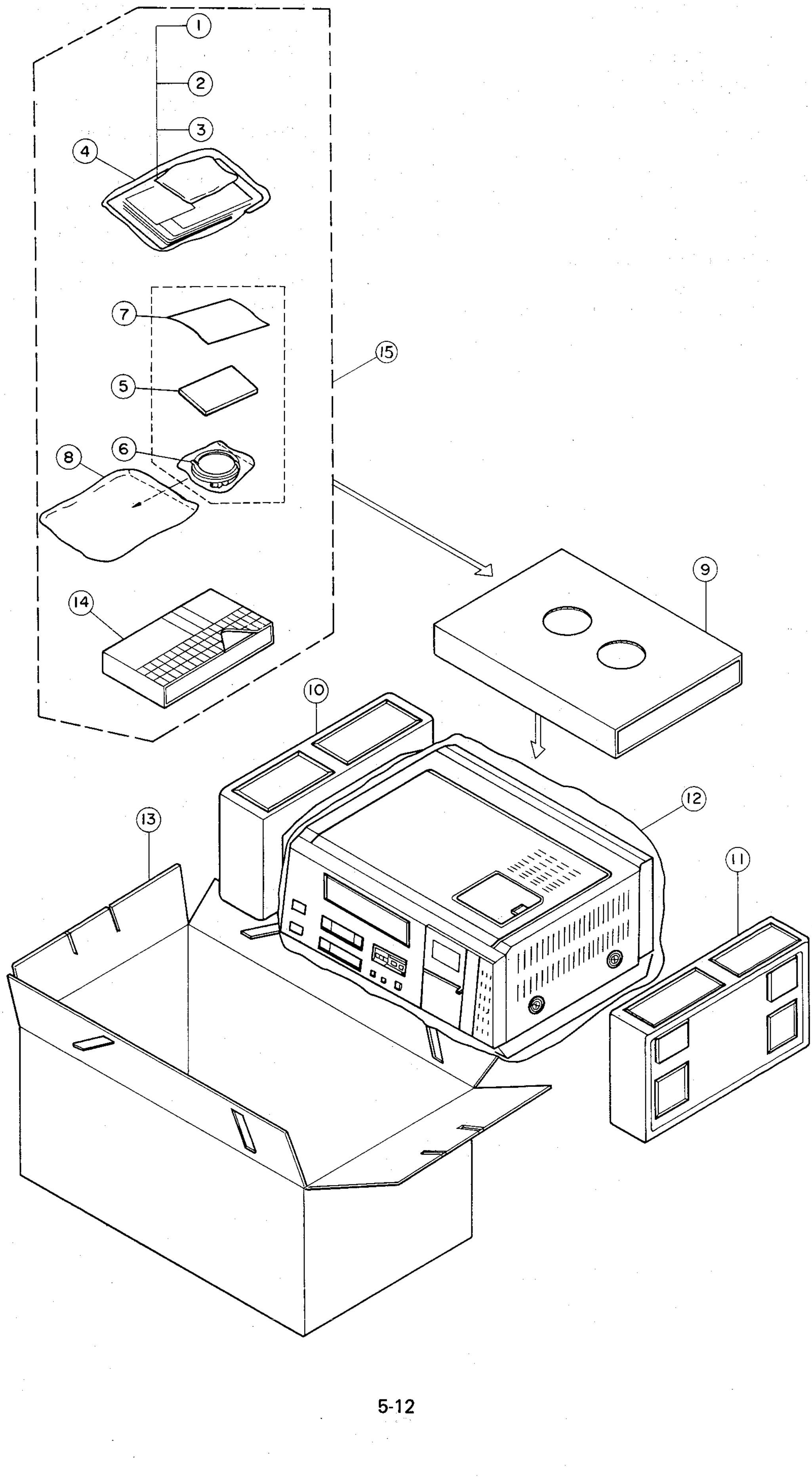
MECHA CHASSIS ASSEMBLY

No.	*Part No.*	*Description*	*Remarks*
1	16172691	Loading Ring Ass'y	
2	16429601	Cap (φ 3)	
3	16429201	Roller, Ring	
4	16875531	Screw M3x8x15BF	
5	16870581	Ring Roller Holder Plate	
6	16285851	Rivet, Push	
7	16571361	Bracket, Sensing Head	
8	79599448	Sensing Head	
9	16876081	Screw M3x8x15BF	
10	91430302	Screw AHEXIN 3x15CF	
11	16429611	Zero Position Guide Frame	
12	16567981	Coil, Spring	
13	16530141	Zero Position Guide Uper Flange	

MECHA CHASSIS ASSEMBLY

No.	*Part No.*	*Description*	*Remarks*
14	16171061	Zero Position Guide Ass'y	
15	16429581	Capstan Oil Stopper	
16	16876081	Screw M3x8x15BF	
17	91430202	Nut (M2)	
18	16429961	Oil Cap	
19	82183HB1	Capstan Housing Ass'y	
20	91014092	Screw CPIMS 4x25x15CF	
21	16626491	Washer (φ 3.4)	
22	16171641	Pinch Roller Ass'y	
23	82181HA1	Mecha Chassis Ass'y	
24	16171831	Capstan Block Ass'y	
25	16170881	Capstan Hdd Ass'y	
26	16429592	Belt, Capstan	

5-8. PACKING ASSEMBLY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PACKING ASSEMBLY

No.	*Part No.*	*Description*	*Remarks*
4	82206YB1	Accessory Sabass'y (2)	
├─ 1	16732141	Number Plate	
├─ 2	16825382	Bag. Poly 260 x 380	
└─ 3	78812052	Instruction Booklet	
8	82207YA1	Accessory Sabass'y (1)	
├─ 7	16825371	Bag. Poly 230 x 310	
├─ 5	16828132	Dust Cover	
└─ 6	70799041	IEC Plug Cable	
15	82206YC1	Accessory Sabass'y (3)	
├─14	79599452	VIDEO TAPE L-250SE	
├─ 9	16828121	Accessory Spacer	
├─ 4	82207YB1	Accessory Sabass'y (2)	
└─ 8	82207YA1	Accessory Sabass'y (1)	
10	16828041	Cushion (L)	
11	16828052	Cushion (R)	
12	16828031	Package Poly Bag.	
13	16828092	Individual Carton	

SECTION 6

ELECTRICAL PARTS LIST

REGULATOR PWB ASS'Y (81205A01)

Reference No.	*Part No.*	*Description*	*Remarks*
TR003, 004, 006, 007, 008, 009, 010	35541931	Transistor, 2SC2785	
TR001	35560611	Transistor, 2SD774K	
D009	36003049	Diode, Zener MPC-574J	
D004, 005	36003072	Diode, RD-6.2EB	
D006	36003903	Diode, Zener 5.6V	
D001	36107288	Diode, D5FB10	
D007, 008, 010, 011	36902080	Diode, 10E2	
VR001	41085054	R, Variable 500Ω	
VR002, 003	41085055	R, Variable 1000Ω	
C014, 015	42019575	C, Ceramic 500V 0.01μF	
C005	43199027	C, Elec. 25V 10000μF	
C017	43991016	C, Elec. 10V 100μF	
C012	43993056	C, Elec. 35V 470μF	
C011	43993095	C, Elec. 100V 47μF	
	66671016	Fuse, 4A (SEMKO)	
C001, 002, 003, 004	421A0425	C. Ceramic 50V 10000pF	
C006, 007, 008, 009, 010	439J3040	C, Elec. 25V 47μF	
C013	439J3060	C, Elec. 50V 1.0μF	
C016	439J3064	C, Elec. 50V 10μF	
D002, 003	360K3955	Diode, RV35V, 52AT	
R003, 012, 013, 018	409H2673	R, Carbon 1.0KΩ 5% ¼W	
RD014	409H2677	R, Carbon 1.5KΩ 5% ¼W	
R004, 019	409H2680	R, Carbon 2.0KΩ 5% ¼W	
R002, 011, 015	409H2681	R, Carbon 2.2KΩ 5% ¼W	
R001, 005, 010, 020, 021	409H2683	R, Carbon 2.7KΩ 5% ¼W	
R009, 016, 017	409H2697	R, Carbon 10KΩ 5% ¼W	
R007	409H2705	R, Carbon 22KΩ 5% ¼W	
R006, 008	409H2713	R, Carbon 47KΩ 5% ¼W	

TIMER PWB ASS'Y (81205F01)

Reference No.	*Part No.*	*Description*	*Remarks*
	16431981	Holder, LED (1)	
TR006, 007, 002, 003, 005	35501131	Transistor, 2SA1175 (E.F.H.J)	
TR002, 003, 005,	35541931	Transistor, 2SC2785 (F.F.H.J.)	
TR001	35542518	Transistor, 2SC1317NC R	
TR001	35542519	Transistor, 2SC1317NC S	
D001	36003904	Diode, Zener 6.2V	
D010, 027	36003955	Diode, RV35V	
D051, 052, 053, 054, 055, 056, 057, 058, 059, 060, 061, 062	36904138	LED (Green)	
D034	36905147	Diode, Zener RD3.0EB2 (A)	
IC002, 003, 004	37101126	IC, UPA80C	
IC001	37151107	IC, UPD-7507C-026	
RM002	39906018	R-Block 10KΩ M*4 1/8W	
RM001	39906033	R-Block 10KΩ M*4	
R036	401K5673	R, Carbon 1KΩ 1/8W	
R034	401K5713	R, Carbon 47KΩ 1/8W	
R035	409H2719	R, Carbon 82KΩ ¼W 5%	
C003	42311033	C, Ceramic 50V 33pF	
C004	42311037	C, Ceramic 50V 47pF	
C001	43099065	Super Capacitor 0.022F	
C002	43993036	C, Elec. 25V 4.7μF	
C005	44209012	C, Trimmer 30pF	
X001	64004113	X'tal (32.768KHz)	
SW012	65180020	Switch, Slide SSY-022	
SW001, 002, 003, 004, 005, 006, 007, 008, 010, 011, 013, 014, 015, 016, 017, 018, 019, 020, 021, 022, 023, 024	65330039	Switch, Tact	
FIP	79599451	FIP (E)	
D007, 020, 022, 023, 024, 025	360K3955	Diode, RV35V, 52AT	
R031	409H2665	R, Carbon 470Ω 5% ¼W	
R025, 026, 027, 028	409H2697	R, Carbon 10KΩ 5% ¼W	
R015, 029	409H2713	R, Carbon 47KΩ 5% ¼W	
R004	409H2719	R, Carbon 82KΩ 5% ¼W	
D002, 003, 005, 006, 008, 009, 011, 012, 014, 015, 017, 018, 019, 021, 026, 028, 029, 030, 031, 032, 033, F004	360V3955	Diode, RV35V, 26AT	
R002, 024	401K5649	R, Carbon 100Ω 1/8W	
R011, 001	401K5685	R, Carbon 3.3KΩ 1/8W	
R016, 022, 023, 030	401K5697	R, Carbon 10KΩ 1/8W	
R003, 006, 008, 010, 014, 020, 021, 032	401K5713	R, Carbon 47KΩ 1/8W	
R005	401K5728	R, Carbon 200KΩ 1/8W	
R001, 033	401K5689	R, Carbon 4.7KΩ 1/8W	
D001, 002, 022, 023, 024, 025	360K3955	Diode RV35V 52AT	

FUNCTION PWB ASS'Y (81205K01)

Reference No.	*Part No.*	*Description*	*Remraks*
	16431981	Holder, LED (1)	
	16431991	Holder, LED (2)	
TR001	35541931	Transistor, 2SC2785 (E.F.H.J)	
D004, 010, 011	36904101	LED (Red) TLR123	
D003, 005, 007, 008, 009	36904102	LED (Green) TLG123A	
D001	36904138	LED (Green)	
D002	36904139	LED, 2x15 RED	
IC002	37101127	IC, UPC-393C	
IC001	37101128	IC, LB-1475	
R017	40950022	R, Carbon 3.6KΩ 2% ¼W	
R016	40950023	R, Carbon 22KΩ 2% ¼W	
R026	40983220	R, Carbon 91KΩ ¼W	
VR001	41085055	R, Variable 1KΩ	
SW003, 004, 005, 007, 008, 009, 010	65330039	Switch, Tact	
SW001, 002	65330040	Switch, Push SPH12	
SW011	65330041	Switch, Push SPH12-2	
D012, 013, 014, 015	360K3955	Diode, RV35V, 52AT	
R001, 002, 003, 004, 005, 007, 008, 009, 010, 011	409H2673	R, Carbon 1.0KΩ 5% ¼W	
R015, 022	409H2685	R, Carbon 3.3KΩ 5% ¼W	
R013	409H2705	R, Carbon 22KΩ 5% ¼W	
R014	409H2713	R, Carbon 47KΩ 5% ¼W	
R012	401K5685	R, Carbon 3.3KΩ 1/8W	
R019	401K5697	R, Carbon 10KΩ 1/8W	
R018	401K5699	R, Carbon 12KΩ 1/8W	
R024, 028	401K5705	R, Carbon 22KΩ 1/8W	
R029	401K5713	R, Carbon 47KΩ 1/8W	
R025	401K5723	R, Carbon 120KΩ 1/8W	
R023, 027	401K5739	R, Carbon 560KΩ 1/8W	
R021	401K5745	R, Carbon 1MΩ 1/8W	

FUNCTION PWB ASS'Y (81205K01)

Reference No.	*Part No.*	*Description*	*Remraks*
	16431981	Holder, LED (1)	
	16431991	Holder, LED (2)	
TR001	35541931	Transistor, 2SC2785 (E.F.H.J)	
D004, 010, 011	36904101	LED (Red) TLR123	
D003, 005, 007, 008, 009	36904102	LED (Green) TLG123A	
D001	36904138	LED (Green)	
D002	36904139	LED, 2x15 RED	
IC002	37101127	IC, UPC-393C	
IC001	37101128	IC, LB-1475	
R017	40950022	R, Carbon 3.6KΩ 2% ¼W	
R016	40950023	R, Carbon 22KΩ 2% ¼W	
R026	40983220	R, Carbon 91KΩ ¼W	
VR001	41085055	R, Variable 1KΩ	
SW003, 004, 005, 007, 008, 009, 010	65330039	Switch, Tact	
SW001, 002	65330040	Switch, Push SPH12	
SW011	65330041	Switch, Push SPH12-2	
D012, 013, 014, 015	360K3955	Diode, RV35V, 52AT	
R001, 002, 003, 004, 005, 007, 008, 009, 010, 011	409H2673	R, Carbon 1.0KΩ 5% ¼W	
R015, 022	409H2685	R, Carbon 3.3KΩ 5% ¼W	
R013	409H2705	R, Carbon 22KΩ 5% ¼W	
R014	409H2713	R, Carbon 47KΩ 5% ¼W	
R012	401K5685	R, Carbon 3.3KΩ 1/8W	
R019	401K5697	R, Carbon 10KΩ 1/8W	
R018	401K5699	R, Carbon 12KΩ 1/8W	
R024, 028	401K5705	R, Carbon 22KΩ 1/8W	
R029	401K5713	R, Carbon 47KΩ 1/8W	
R025	401K5723	R, Carbon 120KΩ 1/8W	
R023, 027	401K5739	R, Carbon 560KΩ 1/8W	
R021	401K5745	R, Carbon 1MΩ 1/8W	

SERVO/AUDIO PWB ASS'Y (81205C01)

Reference No.	*Part No.*	*Description*	*Remarks*
	16571591	Heat Sink (S/A PWB)	
	16876081	Screw STB 3x8x15BF	
TR011, 018	35065416	Transistor, 2SD882 P	
TR001, 006, 026, 202, 210	35501131	Transistor, 2SA1175 (E.F.H.J)	
TR002, 003, 004, 005, 007, 008, 009, 010, 015, 017, 204, 205, 208, 209, 211	35541931	Transistor, 2SC2785 (E.F.H.J)	
TR201, 203	35561200	Transistor, 2SD637	
ZD001	36003904	Diode, Zener 6.2V	
D008, 202, 206	36003955	Diode (RV 35V)	
IC101	37101123	IC, UPC-1504C	
IC102	37101124	IC, UPC-1505C	
IC201	37101125	IC, LA-7040	
R230	40199303	R, Carbon 4.7Ω ¼W	
R083	40399006	RS 1PBR47H J.D 0.47H	
R081	40982109	R, Carbon 2.2Ω ¼W 5%	
R017	40982161	R, Carbon 330Ω ¼W 5%	
R245	40982177	R, Carbon 1.5KΩ ¼W 5%	
R244, 246	40982181	R, Carbon 2.2KΩ ¼W 5%	
R249	40982205	R, Carbon 22KΩ ¼W 5%	
R033, 212	40983155	R, Carbon 180Ω ¼W 5%	
R219, 241	40983161	R, Carbon 330Ω ¼W 5%	
R034	40983173	R, Carbon 1.0KΩ ¼W 5%	
R025	40983186	R, Carbon 3.6KΩ ¼W 5%	
R024	40983194	R, Carbon 7.5KΩ ¼W 5%	
R097	40983197	R, Carbon 10KΩ ¼W 5%	
R032	40983229	R, Carbon 220KΩ ¼W 5%	
R021	40983231	R, Carbon 270KΩ ¼W 5%	
R037	40983249	R, Carbon 1.5MΩ ¼W 5%	
VR011	41085053	R, Variable 300Ω	
VR203	41085059	R, Variable 10KΩ	
VR202	41085060	R, Variable 20KΩ	
VR005, 006	41085062	R, Variable 50KΩ	
VR003, 008	41085063	R, Variable 100KΩ	
VR001, 002	41085064	R, Variable 200KΩ	
VR201	41085066	R, Variable 500KΩ	
VR007	41099072	R, Variable 100KΩ	
C202	42039060	C, Ceramic 500V 560pF	
C054	42110413	C, Ceramic 50V 1000pF	
C004	42110421	C, Ceramic 50V 4700pF	
C036, 232	42110425	C, Ceramic 50V 0.01μF	
C043	42110429	C, Ceramic 50V 0.022μF	
C049	43993026	C, Elec. 16V 33μF	
C204	42754071	C, Mylar 50V 0.047μF	
C207	42754068	C, Mylar 50V 0.027μF	
C201	42130205	C, Ceramic 50V 220pF	
C220	42130207	C, Ceramic 50V 330pF	
C047	42311045	C, Ceramic 50V 100pF	
C208	42311054	C, Ceramic 50V 30pF	
C216	42754053	C, Mylar 50V 1500pF	
C223	42754059	C, Mylar 50V 4700pF	

Reference No.	*Part No.*	*Description*				*Remarks*
C226, C207	42754066	C, Film	50V	0.018μF		
C008, 016	42754063	C, Mylar	50V	0.01μF		
C219	42754064	C, Mylar	50V	0.012μF		
C005, 006	42754065	C, Mylar	50V	0.015μF		
C009, 203	42754067	C, Mylar	50V	0.022μF		
C010	42754070	C, Film	50V	0.039μF		
C044, 204	42754071	C, Mylar	50V	0.047μF		
C041, 046	42754073	C, Mylar	50V	0.068μF		
C040	42754075	C, Mylar	50V	0.1μF		
C015, 039	42754078	C, Mylar	50V	0.33μF		
C014	42754079	C, Mylar	50V	0.47μF		
C021	43515051	C, Tantalum	16V	2.2μF		
C233	43993015	C, Elec.	10V	100μF		
C033, 042, 214	43993024	C, Elec.	16V	10μF		
C050	43993025	C, Elec.	16V	22μF		
C212, 222	43993028	C, Elec.	16V	100μF		
C038	43993060	C, Elec.	50V	1μF		
L203	61052041	Coil, Filter S102K				
L201	61055008	Coil, Filter L-8 223				
L202	61064061	Coil, Filter S153J				
T201	61811012	OSC Trans. 65KHz				
SW101	65330030	Switch, Slide				
JC005	70905322	3.5 Dia. Jack HSJ0800				
JC003, 004	70905358	Remote Jack Dia. 2.5				
C026	421A0413	C, Ceramic	50V	1000pF		
C020	421A0425	C, Ceramic	50V	10000pF		
C019	421A0429	C, Ceramic	50V	22000pF		
C209	421C0213	C, Ceramic	50V	1000pF		
C225	423A1056	C, Ceramic	50V	300pF		
C224	439J3014	C, Elec.	10V	47μF		
C034	439J3015	C, Elec.	10V	100μF		
C001, 013, 228	439J3026	C, Elec.	16V	33μF		
C229	439J3027	C, Elec.	16V	44μF		
C210	439J3036	C, Elec.	10V	4.7μF		
C018	439J3038	C, Elec.	25V	22μF		
C007, 012, 213	439J3040	C, Elec.	25V	47μF		
C221	439J3059	C, Elec.	50V	0.47μF		
C003, 031, 206	439J3060	C, Elec.	50V	1.0μF		
C218	439J3061	C, Elec.	50V	2.2μF		
C002, 021, 022, 037, 045, 215, 231	439J3062	C, Elec.	50V	3.3μF		
C024, 027, 028, 032, 205, 211, 217	439J3064	C, Elec.	50V	10μF		
D009	360V3955	Diode, RV35V, 26AT				
R087	409H2646	R, Carbon	75Ω	5%	¼W	
R202	409H2657	R, Carbon	220Ω	5%	¼W	
R062, 074, 093	409H2673	R, Carbon	1.0KΩ	5%	¼W	
R084	409H2680	R, Carbon	2.0KΩ	5%	¼W	
R018, 221	409H2697	R, Carbon	10KΩ	5%	¼W	
R001	409H2703	R, Carbon	18KΩ	5%	¼W	
R013	409H2704	R, Carbon	20KΩ	5%	¼W	
R060	409H2705	R, Carbon	22KΩ	5%	¼W	
R003	409H2709	R, Carbon	33KΩ	5%	¼W	

Reference No.	*Part No.*	*Description*	*Remarks*
R210, 235	409H2713	R, Carbon 47KΩ 5% ¼W	
R004, 019, 077, 222	409H2721	R, Carbon 100KΩ 5% ¼W	
R011	409H2727	R, Carbon 180KΩ 5% ¼W	
D001, 014, 201, 203	360V3955	Diode, RV35V, 26AT	
R218	401K5667	R, Carbon 560Ω 1/8W	
R073, 078, 086	401K5673	R, Carbon 1KΩ 1/8W	
R085	401K5677	R, Carbon 1.5KΩ 1/8W	
R227	401K5679	R, Carbon 1.8KΩ 1/8W	
R016	401K5680	R, Carbon 2KΩ 1/8W	
R215, 223, 228	401K5681	R, Carbon 2.2KΩ 1/8W	
R030	401K5685	R, Carbon 3.3KΩ 1/8W	
R088, 204, 226	401K5691	R, Carbon 5.6KΩ 1/8W	
R214, 229	401K5695	R, Carbon 8.2KΩ 1/8W	
R002, 005, 014, 233, 240	401K5697	R, Carbon 10KΩ 1/8W	
R023	401K5699	R, Carbon 12KΩ 1/8W	
R066, 063, 072, 216	401K5701	R, Carbon 25KΩ 1/8W	
R022, 038, 203	401K5703	R, Carbon 18KΩ 1/8W	
R009, 012, 059, 076, 080, 207, 208, 225, 231, 232	401K5705	R, Carbon 22KΩ 1/8W	
R020, 036, 039, 040, 042	401K5709	R, Carbon 33KΩ 1/8W	
R061, 211, 234	401K5713	R, Carbon 47KΩ 1/8W	
R217	401K5715	R, Carbon 56KΩ 1/8W	
R051	401K5714	R, Carbon 82KΩ 1/8W	
R026, 079, 201, 209	401K5721	R, Carbon 100KΩ 1/8W	
R213	401K5723	R, Carbon 120KΩ 1/8W	
R007	401K5725	R, Carbon 150KΩ 1/8W	
R205	401K5729	R, Carbon 220KΩ 1/8W	
R092	401K5733	R, Carbon 330KΩ 1/8W	
R010, 031, 206, 224	401K5745	R, Carbon 1MΩ 1/8W	

CHROMA/PRE PWB ASS'Y (81205L01)

Reference No.	*Part No.*	*Description*	*Remarks*
TR225, 226, 304, 306, 307, 308, 309, 501, 502	35501131	Transistor, 2SA1175 (E.F.H.J)	
TR402, 404, 406, 407, 514	35520111	Transistor, 2SB733K	
TR201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 214, 215, 216, 219, 220, 223, 224, 227, 228, 229, 301, 302, 303, 310, 311, 312, 313, 401, 403, 503, 504, 505, 506, 509, 510, 512, 513, 515	35541931	Transistor, 2SC2785 (E.F.H.J)	
TR305	35560611	Transistor, 2SD774K	
TR405	35561316	Transistor, 28D1265P	
TR507, 511	35580604	FET, 2SK152 (4)	
ZD401	36003037	Diode, Zener RD9.1EB	
ZD301	36003072	Diode, RD-6.2EB	
D206	36003955	Diode, RV 35V	
IC501	37101026	IC, CX-134 A	
IC201	37101028	IC, CX-136 A	
IC304	37101031	IC, CX-145	
IC205, 302	37101088	IC, CX150B	
IC301	37101089	IC. CX832	

Reference No.	*Part No.*	*Description*				*Remarks*
IC202, 203	37101102	IC, LA7019				
IC303	37151081	IC, M58478P				
IC305	37151083	IC, HD74LS74AP				
IC308	37151084	IC, HD74LS 10P				
IC306, 307	37151091	IC, HD74LS93P				
R226	401K5695	R, Carbon	8.2KΩ		1/8W	
R224	40105154	R, Carbon	160Ω		1/8W	
R295	40105170	R, Carbon	750Ω		1/8W	
R343	40121639	R, Carbon	39Ω	5%	½W	
R415	40121659	R, Carbon	270Ω	5%	½W	
R501, 533, 537, 555	40199304	R, Carbon	8.2Ω	5%	¼W	
R515	40199305	R, Carbon	39Ω		¼W	
R511	40199306	R, Carbon	82Ω		¼W	
R287	40982159	R, Carbon	270Ω	5%	¼W	
R292	40982197	R, Carbon	10Ω	5%	¼W	
R536	40983121	R, Carbon	6.8Ω	5%	¼W	
R508	40983122	R, Carbon	7.5Ω	5%	¼W	
R288	40983145	R, Carbon	68Ω	50%	¼W	
R531, 553	40983151	R, Carbon	120Ω	50%	¼W	
R284, 535	40983157	R, Carbon	220Ω	50%	¼W	
R294	40983158	R, Carbon	240Ω	50%	¼W	
R289	40983160	R, Carbon	300Ω		¼W	
R338	40983163	R, Carbon	390Ω	5%	¼W	
R335, 507, 532	40983164	R, Carbon	430Ω	5%	¼W	
R204	40983181	R, Carbon	2.2KΩ	5%	¼W	
R263, 266, 350	40983201	R, Carbon	15KΩ	5%	¼W	
R337	40983205	R, Carbon	22KΩ	5%	¼W	
R262, 265	40983209	R, Carbon	33KΩ	5%	¼W	
R505	40983219	R, Carbon	82KΩ	5%	¼W	
VR204, 301, 501	41085055	R, Variable	1KΩ			
VR203, 503, 504, 505	41085056	R, Variable	2KΩ			
VR206, 502	41085057	R, Variable	3KΩ			
VR506	41085058	R, Variable	5KΩ			
VR205	41085059	R, Variable	10KΩ			
VR202	41085060	R, Variable	20KΩ			
C231, 257, 308, 326, 339	42110425	C, Ceramic	50V		0.01μF	
C503	42110429	C, Ceramic	50V		0.022μF	
C204, 206, 221, 229, 255, 258, 259, 301, 328, 336, 340, 346, 517, 525, 530	42110433	C, Ceramic	50V		0.047μF	
C256	42110933	C, Ceramic	50V		0.047μF	
C226	42121053	C, Ceramic	50V		180pF	
C323, 343	42130205	C, Ceramic	50V		220pF	
C350	42130209	C, Ceramic	50V		470pF	
C344	42130211	C, Ceramic	50V		480pF	
C360	42141164	C, Ceramic	25V		0.1μF	
C207, 212, 214, 508, 509, 514, 515	42141172	C, Ceramic	25V		0.047μF	
C321	42141176	C, Ceramic	25V		0.01μF	
C303	42311037	C, Ceramic	50V		47pF	
C333, 334	42311049	C, Ceramic	50V		150pF	
C209	42316032	C, Ceramic	50V		30pF	
C208	42316104	C, Ceramic	50V		18pF	

Reference No.	*Part No.*	*Description*			*Remarks*
C531	42340081	C, Ceramic	50V	56pF	
C318	42754051	C, Mylar	50V	1000pF	
C219, 311	42754067	C, Mylar	50V	0.022μF	
C216	43991069	C, Elec.	50V	4.7μF	
L508, 509	61072005	Coil, Filter A R56			
L201	61072018	Coil, Filter A 6R8K			
L204, 501	61072020	Coil, Filter A 100K			
L502, 503	61072022	Coil, Filter A 150K			
L202, 207	61072023	Coil, Filter A 180K			
L304	61072024	Coil, Filter A 220K			
L506	61072031	Coil, Filter A 820K			
L203, 301, 302, 305, 307	61072040	Coil, Filter A 471K			
L303, 507	61072044	Coil, Filter A 102K			
L306	61072223	Coil, Filter C682J			
L504, 505	61072224	Coil, Filter C822J			
L206	61091006	Coil, Filter 18UH			
CF301	61137001	SFE5.12MB			
FL204	61551022	COM Filter SG-544			
DL201	61551025	ADL-CP042N (1HDL)			
T201	61815058	Band Pass Trans 4.43MHz (ACC)			
T302	61815063	4.43MHz Tuning Trans. (1)			
T301	61815064	4.43MHz Tuning Trans. (2)			
T501, 502	61823008	RF Input Trans.			
X302	64004108	X'tal 4.433619MHz (15pF)			
X301	64004109	X'tal 4.433619MHz (47pF)			
FL201	79552028	Band Pass Filter 4.43MHz			
FL202	79552029	Low Pass Filter 1.5MHz			
FL203	79552034	Band Pass Filter 4.43MHz			
C222, 223, 224, 225, 230, 232, 233, 234, 235, 250, 251, 261, 262, 304, 305, 307, 314, 327, 329, 338, 355, 362, 501, 502, 505	421A0425	C, Ceramic	50V	10000pF	
C507, 511, 513, 524, 534	421A0429	C, Ceramic	50V	22000pF	
C352	421C0205	C, Ceramic	50V	220pF	
C320, 528	421C0207	C, Ceramic	50V	330pF	
C211, 351, 522	421C0209	C, Ceramic	50V	470pF	
C354, 520	421C0211	C, Ceramic	50V	680pF	
C356, 357	421C0212	C, Ceramic	50V	820pF	
C227	423A1023	C, Ceramic	50V	12pF	
C306	423A1025	C, Ceramic	50V	15pF	
C529	423A1027	C, Ceramic	50V	18pF	
C316, 330, 331	423A1031	C, Ceramic	50V	27pF	
C518, 519	423A1038	C, Ceramic	50V	51pF	
C210	423A1039	C, Ceramic	50V	56pF	
C349	423A1045	C, Ceramic	50V	100pF	
C315	423A1047	C, Ceramic	50V	200pF	
C363, 521	423A1051	C, Ceramic	50V	180pF	
C319, 324	429G4006	C, Poly	50V	4700pF	
C345	429G4016	C, Poly	50V	10000pF	
C313	429G4065	C, Poly	50V	22000pF	
C504, 526	439J3026	C, Elec.	16V	33μF	
C205, 218, 228, 302, 337, 347, 535	439J3040	C, Elec.	25V	47μF	

Reference No.	*Part No.*	*Description*			*Remarks*
C361,506	439J3059	C, Elec.	50V	0.47μF	
C236,310,312,317,322,348,532,533	439J3060	C, Elec.	50V	1.0μF	
C213,220,516	439J3061	C, Elec.	50V	2.2μF	
C215,238,353,358,359	439J3063	C, Elec.	50V	4.7μF	
C325,335,341,342	439J3064	C, Elec.	50V	10μF	
R290	409T2647	R, Carbon	82Ω	¼W	
R258	409T2649	R, Carbon	100Ω	¼W	
R530	409T2651	R, Carbon	120Ω	¼W	
R349	409T2659	R, Carbon	270Ω	¼W	
R346	409T2665	R, Carbon	470Ω	¼W	
R291	409T2667	R, Carbon	560Ω	¼W	
R244,278,378	409T2673	R, Carbon	1KΩ	¼W	
R552	409T2681	R, Carbon	2.2KΩ	¼W	
R293	409T2686	R, Carbon	3.6KΩ	¼W	
R209	409T2691	R, Carbon	5.6KΩ	¼W	
R565	409T2697	R, Carbon	10KΩ	¼W	
C246,247	421M1027	C, Ceramic	50V	270pF	
C201,217,254	421P2127	C, Ceramic	25V	0.22μF	
C202,203,242,244,245,248,249,332, 510,512,523,527	421P2133	C, Ceramic	25V	0.1μF	
D201,202,203,204,205,207,208,211, 212,302,303,304,305,306,308,309, 310,401,503,504,505,506,507,508, 509, 307, 501, 502	360V3955	Diode, RV35V, 26AT			
R215,243,261,267,275,330,377,512	401K5649	R, Carbon	100Ω	1/8W	
R206	401K5657	R, Carbon	220Ω	1/8W	
R232	401K5659	R, Carbon	270Ω	1/8W	
R334,504,517,520,524,527	401K5663	R, Carbon	390Ω	1/8W	
R223,318,356	401K5665	R, Carbon	470Ω	1/8W	
R544	401K5667	R, Carbon	560Ω	1/8W	
R301,302,519,528,550	401K5668	R, Carbon	620Ω	1/8W	
R221,306	401K5669	R, Carbon	680Ω	1/8W	
R307	401K5671	R, Carbon	820Ω	1/8W	
R201,217,218,225,230,231,304,308, 316,342,347,367,375,379,384,542, 543,548	401K5673	R, Carbon	1KΩ	1/8W	
R233,259,341,545	401K5675	R, Carbon	1.2KΩ	1/8W	
R260,309,339,509,510	401K5677	R, Carbon	1.5KΩ	1/8W	
R319	401K5679	R, Carbon	1.8KΩ	1/8W	
R234,248,264,325,408,538,539,540, 541	401K5681	R, Carbon	2.2KΩ	1/8W	
R247,315,324,344,345,359,362,365, 502, 516, 525	401K5685	R, Carbon	3.3KΩ	1/8W	
R205,216,228,331,354,369,551	401K5689	R, Carbon	4.7KΩ	1/8W	
R320	401K5690	R, Carbon	5.1KΩ	1/8W	
R220,305,370,405,534,546,549	401K5691	R, Carbon	5.6KΩ	1/8W	
R303,329,352,353,360	401K5693	R, Carbon	6.8KΩ	1/8W	
R328	401K5694	R, Carbon	7.5KΩ	1/8W	
R314	401K5695	R, Carbon	8.2KΩ	1/8W	
R236,242,249,279,283,286,310,312, 321,336,351,371,374,381,404,409, 410,412,414,506,514,518,521,526, 529,547,556,559	401K5697	R, Carbon	10KΩ	1/8W	

Reference No.	*Part No.*	*Description*				*Remarks*
R246, 372	401K5699	R, Carbon	12KΩ	1/8W		
R503	401K5700	R, Carbon	13KΩ	1/8W		
R285, 363, 364, 376	401K5701	R, Carbon	15KΩ	1/8W		
R357, 366	401K5703	R, Carbon	18KΩ	1/8W		
R210, 211, 212, 214, 276, 373, 557, 561, 562	401K5705	R, Carbon	22KΩ	1/8W		
R326, 332	401K5706	R, Carbon	24KΩ	1/8W		
R208, 213, 245, 250, 277, 280, 281, 282, 327, 380, 411, 413, 554, 558	401K5709	R, Carbon	33KΩ	1/8W		
R322	401K5711	R, Carbon	39KΩ	1/8W		
R317, 333, 406, 407	401K5713	R, Carbon	47KΩ	1/8W		
R219, 311, 313, 348, 513	401K5715	R, Carbon	56KΩ	1/8W		
R358	401K5717	R, Carbon	68KΩ	1/8W		
R222, 361, 368, 560	401K5721	R, Carbon	100KΩ	1/8W		
R355	401K5725	R, Carbon	150KΩ	1/8W		
R202, 207, 227, 229	401K5729	R, Carbon	220KΩ	1/8W		
R323	401K5737	R, Carbon	470KΩ	1/8W		
R403	409T2673	R, Carbon	1KΩ	¼W		
R401, 402	409T2705	R, Carbon	22KΩ	¼W		

LINE FILTER PWB ASS'Y (81205S01)

C801	42770082	C, Film	630V	0.022μF		
L801	61826003	Coil, Line Filter				
F801	66671004	Fuse 1.6A				
	71205037	Fuse, Holder				
	72374371	PWV-437 Line Filter				

Y PROCESS PWB ASS'Y (81206B01)

TR004, 006, 007, 016	35501131	Transistor, 2SA1175 (E, F, H, J)				
TR022	35520111	Transistor, 2SB733K				
TR001, 003, 005, 008, 011, 012, 013, 014, 015, 017, 019, 020, 021, 023, 018	35541931	Transistor, 2SC2785 (E, F, H, J)				
D006	360K1522	Diode, 1S953, AT				
D006	36001522	Diode, 1S953				
IC001	37101100	IC, LA7020				
IC002	37101101	IC, LA7025				
IC003	37151088	IC, 14069 UBP				
R074	40982173	R, Carbon	1.0KΩ	¼W	5%	
R072	40982209	R, Carbon	33KΩ	¼W	5%	
R025	40983141	R, Carbon	47Ω	¼W	5%	
R078	40983145	R, Carbon	68Ω	¼W	5%	
R096	40983176	R, Carbon	1.3KΩ	¼W	5%	
R027	40983152	R, Carbon	130Ω	¼W	5%	
R075, 076	40983153	R, Carbon	270Ω	¼W	5%	
R013	40983156	R, Carbon	200Ω	¼W	5%	
R041	40983158	R, Carbon	240Ω	¼W	5%	
R056	40983160	R, Carbon	300Ω	¼W	5%	
R077	40983170	R, Carbon	750Ω	¼W	5%	
R053	40983173	R, Carbon	1.0KΩ	¼W	5%	

Reference No.	*Part No.*	*Description*	*Remarks*
R052	40983192	R, Carbon 6.2KΩ ¼W 5%	
R059	40983228	R, Carbon 200KΩ ¼W 5%	
R087	40983238	R, Carbon 510KΩ ¼W 5%	
R089	40983261	R, Carbon 4.7MΩ ¼W 5%	
VR003	41085054	R, Variable 500Ω	
VR002,004,008,011	41085055	R, Variable 1KΩ	
VR006,007,010	41085056	R, Variable 2KΩ	
VR001	41085058	R, Variable 5KΩ	
VR009	41085059	R, Variable 10KΩ	
VR005	41085061	R, Variable 30KΩ	
C009,017,022,036,041,052,060,061, 063	42110433	C, Ceramic 50V 0.047μF	
C038	42121064	C, Ceramic 50V 510pF	
C008	42130211	C, Ceramic 50V 480pF	
C056,057,058	42141164	C, Ceramic 25V 0.1μF	
C046	42141172	C, Ceramic 25V 0.047μF	
C006,047	42141176	C, Ceramic 25V 0.01μF	
C049	423A1102	C, Ceramic 50V 510pF	
C016	423A2038	C, Ceramic 50V 51pF	
C059	42141176	C, Ceramic 25V 0.01μF	
C035	42311039	C, Ceramic 50V 56pF	
C025	42311100	C, Ceramic 50V 390pF	
C048	42311102	C, Ceramic 50V 510pF	
C030	42312038	C, Ceramic 50V 510pF	
C027	42340079	C, Ceramic 50V 47pF	
C051	42754060	C, Mylar 50V 5600pF	
C042	43993019	C, Elec. 10V 1000pF	
C032	43993063	C, Elec. 50V 4.7μF	
L003,006	61072023	Coil, Filter A 180K	
L007	61072024	Coil, Filter A 220K	
L010	61072026	Coil, Filter A 330K	
L004,008	61072031	Coil, Filter A 820K	
L002,005	61072034	Coil, Filter A 151K	
L009	61072040	Coil, Filter A 471K	
T001	61815091	Trap 5.5MHz	
FL001	79552030	Low Pass Filter 3.0MHz (REC)	
FL002	79552031	Low Pass Filter 3.0MHz (Play Back)	
FL003	79552035	Delay Line 600N Sec.	
C019,020,034,039	421A0425	C, Ceramic 50V 10000pF	
C044	421C0210	C, Ceramic 50V 560pF	
C018	421C0211	C, Ceramic 50V 680pF	
C015	421C0212	C, Ceramic 50V 820pF	
C031	423A1031	C, Ceramic 50V 27pF	
C065	423A1035	C, Ceramic 50V 39pF	
C028	423A1047	C, Ceramic 50V 200pF	
C011,024	423A1051	C, Ceramic 50V 180pF	
C026	423A1056	C, Ceramic 50V 300pF	
C045	429G4005	C, Doly 50V 3300pF	
C007,010,012,021,040,055	439J3014	C, Ceramic 10V 47pF	
C001,029,033,043	439J3015	C, Elec. 10V 100μF	
C005	439J3026	C, Elec. 16V 33pF	

Reference No.	*Part No.*	*Description*			*Remarks*
C004	439J3038	C, Elec.	25V	22pF	
C053	439J3040	C, Elec.	25V	47pF	
C037	439J3063	C, Elec.	50V	4.7uF	
D003,004,005,007,008,009	360V3955	Diode, RV35V, 26AT			
R001,034,038,058	401K5649	R, Carbon	100Ω J, A		
R028,035	401K5653	R, Carbon	150Ω J, A		
R060	401K5657	R, Carbon	220Ω J, A		
R042	401K5659	R, Carbon	270Ω J, A		
R108	401K5665	R, Carbon	470Ω	1/8W	
R049,050	401K5667	R, Carbon	560Ω	1/8W	
T048	401K5668	R, Carbon	620Ω	1/8W	
R018,040	401K5671	R, Carbon	820Ω	1/8W	
R004,005,006,008,010,012,017,021, 045,047,061,062,070	401K5673	R, Carbon	1KΩ	1/8W	
R094	401K5675	R, Carbon	1.2KΩ	1/8W	
R024,030,044	401K5678	R, Carbon	1.6KΩ	1/8W	
R043,063,122	401K5679	R, Carbon	1.8KΩ	1/8W	
R011	401K5680	R, Carbon	2KΩ	1/8W	
R036,037,039,090,105,110	401K5681	R, Carbon	2.2KΩ	1/8W	
R051	401K5683	R, Carbon	2.7KΩ	1/8W	
R023,055,109,118	401K5685	R, Carbon	3.3KΩ	1/8W	
R100,106,107	401K5687	R, Carbon	3.9KΩ	1/8W	
R020	401K5689	R, Carbon	4.7KΩ	1/8W	
R054	401K5690	R, Carbon	5.1KΩ	1/8W	
R057,098	401K5691	R, Carbon	5.6KΩ	1/8W	
R022	401K5693	R, Carbon	6.8KΩ	1/8W	
R093,099	401K5694	R, Carbon	7.5KΩ	1/8W	
R097	401K5695	R, Carbon	8.2KΩ	1/8W	
R029	401K5696	R, Carbon	9.1KΩ	1/8W	
R002,003,007,016,046,081,091,114, 116,117,120	401K5697	R, Carbon	10KΩ	1/8W	
R092	401K5699	R, Carbon	12KΩ	1/8W	
R082,086,111	401K5705	R, Carbon	22KΩ	1/8W	
R073,079,080,113,121	401K5709	R, Carbon	33KΩ	1/8W	
R095	401K5680	R, Carbon	2KΩ	1/8W	
R102	401K5657	R, Carbon	220Ω	1/8W	
R103,104	402K5709	R, Carbon	33KΩ	1/8W	
R083,088,112	401K5713	R, Carbon	47KΩ	1/8W	
R009	401K5715	R, Carbon	56KΩ	1/8W	
R101	401K5716	R, Carbon	62KΩ	1/8W	
R084,115	401K5721	R, Carbon	100KΩ	1/8W	
R019	401K5723	R, Carbon	120KΩ	1/8W	
R026,085	401K5725	R, Carbon	150KΩ	1/8W	
R015,071	401K5745	R, Carbon	1MΩ	1/8W	

PST PWB ASS'Y (81206Q01)

Reference No.	*Part No.*	*Description*				*Remarks*
TR002,005	35501131	Transistor, 2SA1175 (E, F, H, J)				
TR001,003,004,006,007	35541931	Transistor, 2SC2785 (E, F, H, J)				
IC001	37101103	IC, MPC1363C (CH SEL)				
R006,020	401K5697	R, Carbon		10KΩ	1/8W	
PST1	41098318	R, Variable Selector 6 Key (A)				
PST2	41098319	R, Variable Selector 6 Key (B)				
C006	42110429	C, Ceramic	50V	0.022μF		
C004	42199002	C, Ceramic	50V	0.1μF		
C005	43993024	C, Elec.	16V	10μF		
C007	43993036	C, Elec.	25V	4.7μF		
C001	43993060	C, Elec.	50V	1μF		
C002,003	43993061	C, Elec.	50V	2.2μF		
SW001,002	65180009	Switch, Slide				
D001,028,029,030,031,032	360K3955	Diode, RV35V, 52AT				
R010,013,016	409H2697	R, Carbon		10KΩ	¼W	
R001,002,003	409H2713	R, Carbon		47KΩ	¼W	
R017	409H2717	R, Carbon		68KΩ	¼W	
R009	409H2723	R, Carbon		120KΩ	¼W	
R005	409H2737	R, Carbon		470KΩ	¼W	
D002,003,004,005,006,007,008,009, 010,011,012,013,014,015,016,017, 018,019,020,021,022,023,024,025, 026,027,033,034,035,036,037,038	360V3955	Diode, RV35V, 26AT				
R018,019	401K5681	R, Carbon		2.2KΩ	1/8W	
R011,012,014,015	401K5713	R, Carbon		47KΩ	1/8W	
R008	401K5725	R, Carbon		150KΩ	1/8W	
R004	401K5737	R, Carbon		470KΩ	1/8W	

TU-VIF PWB ASS'Y (81207E01)

Reference No.	*Part No.*	*Description*				*Remarks*
	34390003	Tuner, Elec. U/V				
TR001	35049700	Transistor, 2SC388A				
TR005,006,007	35501131	Transistor, 2SA1175 (E, F, H, J)				
TR004	35520111	Transistor, 2SB733K				
TR002,003,008	35541931	Transistor, 2SC2785 (E, F, H, J)				
IC002	37001031	IC, HA1124 (SND)				
IC001	37007011	IC, TA7607AP (VIF)				
R023,038	40002017	R, Solid		22Ω	¼W	10%
R049	40982145	R, Carbon		68Ω	¼W	
R048	40982182	R, Carbon		2.4KΩ	¼W	
R012	40983161	R, Carbon		330Ω	¼W	
VR001	41085058	R, Variable		5KΩ	¼W	
C003,007,015	42110425	C, Ceramic	50V	0.01μF		
C017,018	42130209	C, Ceramic	50V	470pF		
C031	423A2023	C, Ceramic	50V	12pF		
C014	42312035	C, Ceramic	50V	39pF		
C034	42754059	C, Mylar	50V	4700pF		
C008	43515051	C, Tantalum	16V	2.2μF		
C026	43993029	C, Elec.	16V	220pF		

Reference No.	*Part No.*	*Description*			*Remarks*
L004, 007	61072122	Coil, Filter B150KA			
L006	61072123	Coil, Filter B180KA			
L005	61072129	Coil, Filter B560KA			
FL003, 004	61102003	SIF Filter SFE 5.5MB			
FL002	61111004	Ceramic Trap 5.5MHz			
FL001	61120006	VIF SAWF 38m F1024			
T003	61815087	Phose Det Coil			
L002	61815094	Coil, Matching (A)			
L003	61815095	Coil, Matching (B)			
T001, 002	61815097	VIF-Trans			
C036	439J3060	C, Elec.	50V	1.0μF	
L006	61072128	Coil, Filter B470KA			
R004	401K5645	R, Carbon	68Ω	¼W	
R017	401K5727	R, Carbon	180KΩ	1/8W	
R035	401K5689	R, Carbon	4.7KΩ	1/8W	
R036	401K5680	R, Carbon	2KΩ	1/8W	
R037	401K5673	R, Carbon	1KΩ	1/8W	
C001, 002, 004, 005, 006, 019, 020, 030	421A0425	C, Ceramic	50V	10000pF	
C009	421C0209	C, Ceramic	50V	470pF	
C024	423A1025	C, Ceramic	50V	15pF	
C025	423A1041	C, Ceramic	50V	68pF	
C012, 013	423A2003	C, Ceramic	50V	3pF	
C027, 033	439J3024	C, Elec.			
C023, 028, 029, 035	439J3027	C, Elec.	16V	47pF	
C016	439J3028	C, Elec.	16V	100pF	
C036	439J3060	C, Elec.	50V	1.0μF	
C022	439J3063	C, Elec.	50V	4.7μF	
R042	409H2697	R, Carbon	10KΩ	¼W	
R004	401K5645	R, Carbon	68Ω	1/8W	
R001	401K5647	R, Carbon	82Ω	1/8W	
R025	401K5657	R, Carbon	220Ω	1/8W	
R005, 007, 024, 027, 033, 041	401K5661	R, Carbon	330Ω	1/8W	
R015	401K5665	R, Carbon	470Ω	1/8W	
R006	401K5669	R, Carbon	680Ω	1/8W	
R008, 018, 019, 026, 032	401K5673	R, Carbon	1KΩ	1/8W	
R028, 040	401K5675	R, Carbon	1.2KΩ	1/8W	
R003	401K5677	R, Carbon	1.5KΩ	1/8W	
R010	401K5681	R, Carbon	2.2KΩ	1/8W	
R011	401K5683	R, Carbon	2.7KΩ	1/8W	
R035	401K5689	R, Carbon	4.7KΩ	1/8W	
R002	401K5691	R, Carbon	5.6KΩ	1/8W	
R029	401K5693	R, Carbon	6.8KΩ	1/8W	
R036, 039	401K5697	R, Carbon	10KΩ	1/8W	
R013, 050	401K5699	R, Carbon	12KΩ	1/8W	
R037	401K5703	R, Carbon	18KΩ	1/8W	
R031	401K5709	R, Carbon	33KΩ	1/8W	
R030	401K5711	R, Carbon	39KΩ	1/8W	
R020, 021, 022	401K5713	R, Carbon	47KΩ	1/8W	
R016	401K5721	R, Carbon	100KΩ	1/8W	
R017	401K5727	R, Carbon	180KΩ	1/8W	
R014	401K5729	R, Carbon	220KΩ	1/8W	
R009	401K5739	R, Carbon	560KΩ	1/8W	

SYSCON PWB ASS'Y (81205D01)

Reference No.	*Part No.*	*Description*	*Remarks*
	16286292	Support Spacer	
TR006, 010, 011, 025, 026, 035	35065416	Transistor, 2SD882P	
TR001, 021, 028, 031	35501131	Transistor, 2SA1175 (E, F, H, J)	
TR007, 008, 022, 023	35501216	Transistor, 2SB772 (P)	
TR002, 003, 004, 005, 009, 012, 013, 014, 015, 017, 018, 019, 020, 024, 027, 029, 030, 032, 033, 034, 036, 037, 038, 039, 040	35541931	Transistor, 2SC2785 (E, F, H, J)	
D002, 011, 012, 013, 014, 015, 016, 017, 018	36902080	Diode, 10E2	
IC001	37151106	IC, UPD 546C-330	
IC003, 004, 005	37151108	IC, UPD 4503BC	
OSC001	39080008	Ceramic Resonator 400KHz	
RM008	39906017	R-Block 100K, M*10 1/8W	
RM002, 003, 004, 005, 009	39906018	R-Block 100K, M*4 1/8W	
RM006	39906025	R-Block 100K, M*8	
RM007, 010	39906031	R-Block 100K, M*5	
RM001	39906032	R-Block 100K, M*9	
R161	40102697	R, Carbon 10KΩ 1/3W	
R162	40102733	R, Carbon 330KΩ 1/3W	
R101	40112165	R, Carbon 470Ω 1/3W	
R006	40121149	R, Carbon 100Ω ½W	
J080	40199310	R, Carbon 16Ω ¼W	
R002, 003	40809875	R, Carbon 3.3Ω ¼W	
R041	40983197	R, Carbon 10KΩ ¼W	
R092	40983201	R, Carbon 15KΩ ¼W	
VR001, 003, 004	41085055	R, Variable 1KΩ	
VR002	41085056	R, Variable 2KΩ	
C006, 026	42110437	C, Ceramic 50V 0.1μF	
C001	42311100	C, Ceramic 50V 390pF	
C016, 020	42754058	C, Mylar 50V 3900pF	
C017, 019	42754067	C, Mylar 50V 0.022μF	
C004	43993060	C, Elec. 50V 1μF	
C030	43993064	C, Elec. 50V 10μF	
RL001	65604054	Relay G2U	
C008, 009, 010, 012, 013, 014, 015, 029	421A0425	C, Ceramic 50V 10000pF	
C018, 021	421A0429	C, Ceramic 50V 0.022μF	
C002	423A1045	C, Ceramic 50V 100pF	
C022, 023	439J3059	C, Elec. 50V 0.47μF	
C024	439J3061	C, Elec. 50V 2.2μF	
C005, 007, 025	439J3064	C, Elec. 50V 10μF	
R099	409H2643	R, Carbon 56Ω ¼W	
R020	409H2651	R, Carbon 120Ω ¼W	
R032, 033, 075, 076	409H2665	R, Carbon 470Ω ¼W	
R044	409H2673	R, Carbon 1.0KΩ ¼W	
R022, 024, 025, 067, 068, 103	409H2681	R, Carbon 2.2KΩ ¼W	
R036, 038, 047, 071, 079, 081	409H2697	R, Carbon 10KΩ ¼W	
R010, 012, 014, 016, 026, 028, 109, 111, 113, 117, 129, 135, 137, 139, 141, 153	409H2705	R, Carbon 22KΩ ¼W	
R069, 070, 154, 155	409H2713	R, Carbon 47KΩ ¼W	

Reference No.	*Part No.*	*Description*			*Remarks*
D001, 003, 004, 005, 008, 009, 010, 019, 020	360V3955	Diode, RV35V 26AT			
R090	401K5643	R, Carbon	56Ω	1/8W	
R019, 029, 039, 040, 160	401K5673	R, Carbon	1KΩ	1/8W	
R106	401K5678	R, Carbon	1.6KΩ	1/8W	
R023, 063, 101, 102	401K5681	R, Carbon	2.2KΩ	1/8W	
R084, 093	401K5685	R, Carbon	3.3KΩ	1/8W	
R009, 034, 035, 077, 078	401K5689	R, Carbon	4.7KΩ	1/8W	
R082, 091	401K5693	R, Carbon	6.8KΩ	1/8W	
R030, 031, 053, 056, 059, 073, 074	401K5697	R, Carbon	10KΩ	1/8W	
R008, 083	401K5701	R, Carbon	15KΩ	1/8W	
R094	401K5704	R, Carbon	20KΩ	1/8W	
R005, 007, 018, 027, 062, 064, 085, 086, 089, 095, 098, 104, 115, 119, 121, 123, 125, 127, 131, 133, 143	401K5705	R, Carbon	22KΩ	1/8W	
R087, 096	401K5709	R, Carbon	33KΩ	1/8W	
R042, 043, 107	401K5713	R, Carbon	47KΩ	1/8W	
R011, 021, 048, 072, 088, 097, 105	401K5721	R, Carbon	100KΩ	1/8W	
R159	401K5729	R, Carbon	220KΩ	1/8W	
R001	401K5745	R, Carbon	1MΩ	1/8W	

TU SENS PWB ASS'Y (81203TV1)

R001, 005	401K5649	R, Carbon	100Ω	1/8W
R002	401K5699	R, Carbon	12KΩ	1/8W
R004	401K5715	R, Carbon	56KΩ	1/8W
R003	401K5733	R, Carbon	330KΩ	1/8W

SYS 12V TR SASSY

TR002	35561316	Transistor 2SD1265 P

REG 10V TR SASSY

TR006	35561316	Transistor 2SD1265 P

TAPE COUNTER SASSY

TR001	35541931	Transistor 2SC2785 (E.F.HJ)		
C001	43993024	C, Elec.	16V	10μF
~~C002~~	~~43993026~~	~~C, Elec.~~	~~16V~~	~~33μF~~
MS001	79599384	Sensor, Magnet DM-101A		